



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

THE

Journal of the Society of Arts,

AND OF

THE INSTITUTIONS IN UNION.

111TH SESSION.]

FRIDAY, DECEMBER 23, 1864.

[No. 631. VOL. XIII.

TABLE OF CONTENTS.

Announcements by the Council:—Cantor Lectures — Art - Workmanship Prizes Page 87	Dublin International Exhibition, 1865 ... 98	way in New Zealand — Natal — Australian Coinage 102
Proceedings of the Society:—Cantor Lectures : 2nd Lecture — Sixth Ordinary Meeting—A Short Review of the Society's Past and Present Action in the Promotion of Industrial Education, by S. T. Davenport, Esq. 88	Fine Arts : — Royal Academy — The Queen's New Cameos — Re-arrangement in the Louvre 99	Notes:—Social Science Association—Improved Level—Gas in Egypt—Paris International Exhibition, 1867—Exhibition of Dogs in Paris 103
Discussion 93	Manufactures : — Gamboe — Church Bells—Portsmouth Block Machinery — Petroleum as Fuel 100	Correspondence : — Radial Locomotives, Spring Tires, and Wood Wheels ... 103
Royal Scottish Society of Arts 97	Commerce :—Import of Cotton—Plumbago on Lake Superior—Bonnets ... 101	Meetings for the Ensuing Week ... 104
	Colonies:—New Zealand—Another Railway in New Zealand — Natal — Australian Coinage 102	Patents 104

Announcements by the Council.

CANTOR LECTURES.

"ON THE REPRODUCTION OF NATURAL FORMS BY ART AND MANUFACTURE." By B. WATERHOUSE HAWKINS, Esq., F.G.S., F.L.S.

JAN. 16TH, 1865.—LECTURE III.—On the varieties of artistic treatment of the forms of animal and vegetable life—pictorial representation; conventional ornamental, allegorical, and symbolic combinations of animal forms.

JAN. 23RD.—LECTURE IV.—On the fitness of designs, and their adaptation to the conditions of the materials in which they are to be produced. (Demonstrated by metal-work processes, sand-moulding, casting, and chasing).

JAN. 30TH.—LECTURE V.—On Ceramic Manufactures, with the Influence of the material on the design and its successful production—modern Terra-Cotta, Della Robbia ware, Majolica, and Parian.

These Lectures are open to Members free of charge, and a Member has the privilege of introducing ONE Friend to each Lecture. A set of tickets for this purpose has been sent to every member.

ART-WORKMANSHIP PRIZES.

The Articles sent in competition for the Art-Workmanship Prizes are now arranged for display in the Society's Great Room, and the Members of the Society, as well as Art-Workmen, are invited to inspect them on and after Monday next, the 26th instant, between the hours of 10 and 4. To suit the convenience of Artizans, it is the intention of the Council to open the rooms on several evenings, the dates of which will be advertised as soon as arranged.

Proceedings of the Society.

CANTOR LECTURES.

SECOND LECTURE.—MONDAY, DEC. 19.

MR. HAWKINS first mentioned the fact, that though the union of art and manufactures had been termed by the artist and lecturer Hayden, an "unholy alliance," it is not so in reality, but it is a natural and necessary union, only rendered "unholy" by the war between designer and manufacturer, which is caused by the ignorance on the part of the artist of the inevitable conditions of the material in which his work is to be produced, and the process by which it is to be multiplied, multiplication being the means by which objects of art are put within the reach of the public. Mr. Hawkins then called attention to a shield, lent by Messrs. Elkington, the original price of which was £500, but which, by the happy co-operation of artist and manufacturer, has been multiplied so successfully that it is now offered to the public at less than £20.

Having continued his argument on the subject of art education, Mr. Hawkins proceeded to illustrate his assertion, that a knowledge of the structure of the object which he had to represent was necessary to the artist, by showing, that if the Board of Trade were to employ an artist to represent the positions of a locomotive engine whenever accidents occurred, the first requisite for such a person would be that he should possess a thorough knowledge of the structure of a locomotive engine; and if this were necessary, how much more necessary would it be that an artist, wishing to represent an animal, should possess a knowledge of the structure of animals, which are so much more varied in their attitudes than any steam engine could be even under the most peculiar circumstances of an accident. The lecturer compared the furnace of an engine to the stomach of animals, the heat and blood to the steam, and the cylinder and valve to the lungs, thus showing a parallel for three of the great elements of the animal structure; but he further pointed out that there is in the living being a fourth element, namely, the will, represented by the brain, and conveyed over the whole body by cords which might be compared

to the electric telegraph. This fourth element, being unrepresented in the machine, has to be supplied by a man, who acts as brain to the steam engine, controlling its force, and bringing it into subjection for his own uses. Having sketched on his black canvass a locomotive engine, and the internal structure of a vertebrate animal, Mr. Hawkins observed that this plan of structure is the one plan upon which all vertebrate animals, from the creation even until now have been constructed, the Creator's first design being so perfect as to have been susceptible of every modification necessary to the varied conditions of life on the earth, and in the air and water. By the alteration of a few chalk lines, Mr. Hawkins converted his sketch of a fish into a seal, and from a seal to a deer. He also observed that the unity of plan in animal forms is a great advantage to the artist, so that when he has thoroughly mastered the structure of a typical vertebrate animal, it becomes a comparatively easy task for him to acquaint himself with its various modifications. It is not enough that a draughtsman should imitate the appearance of an animal when he can get one to stand still for him; it is necessary that the designer should be able to represent animal forms in any of the varied attitudes which they may assume without their being present to his corporeal eyes, and this he can only do by being thoroughly acquainted with their structure, with the space occupied by the various parts, and the proportion which they bear to one another. By the system now adopted in art schools the hand of the artist only is educated, and his work is therefore merely imitation, not representation. If the mind of the artist be educated he will possess efficient power to control the movements of his hand, which is made by God to express man's will; and even when the right hand is injured the mind of man has efficient power over the left to compel it to express his will with equal accuracy. By spending his energies in acquiring mere power of handling, the artist neglects his mind; his inventive faculties are not developed; and, instead of enhancing the value of manufactures, which is the true province of decorative art, it is, by this fault in education, lowered in its character, and art thus becomes an enemy to manufactures.

SIXTH ORDINARY MEETING.

Wednesday, December 21st, 1864; William Hawes, Esq., Chairman of Council, in the chair.

The following candidates were proposed for election as members of the Society:—

Haines, Alfred, Kensal-house, Harrow-road, W.
Knowles, S., Tottington, near Bury, Lancashire.
Mayson, J. S., Charlotte-street, Manchester.
Peacock, Edmund, 18, Holford-square, Pentonville, W.C.
Tremlett, Rev. Francis W., LL.D., the Parsonage, Belsize-park, N.W.
Whitehead, J. B., Rawtenstall, Lancashire.

The following candidates were balloted for and duly elected members of the Society:—

Abel, Charles Denton, 20, Southampton-buildings, W.C.
Brinsmead, Henry, 12, Rathbone-place, W.
Sharp, Philip Henry, 18, East-parade, Leeds.
Simonds, Professor James B., Royal Veterinary College, Camden-town, N.W.
Simpson, J. Hawkins, 40, Bedford-place, Russell-square, W.C.
Smart, James Joseph, Secretary of the United Service Club, Pall-mall, S.W., and 3, Lambton-terrace, Westbourne-grove, W.
Sundius, Charles C., 54, Piccadilly.
Thompson, Frederick, Urmstone Lodge, Wimbledon-park, S.W.
Varnell, Professor George, Royal Veterinary College, Camden-town, N.W.

The following Institution has been taken into Union since the last announcement:—

Clitheroe, Mechanics' Institute.

The articles sent in competition for the Art Workmanship Prizes offered by the Society, were arranged in the room for the inspection of the members.

The Paper read was—

A SHORT REVIEW OF THE SOCIETY'S PAST AND PRESENT ACTION IN THE PROMOTION OF INDUSTRIAL EDUCATION.

By S. T. DAVENPORT, Esq.

The address read by the Chairman of the Council at the opening of the present Session, and the remarks made upon it by the Vice-Chancellor (Sir William Page Wood) and other members, has led me to review the various steps which have been taken since the incorporation of the Society by Royal Charter, in the promotion of Industrial Instruction. I have endeavoured to record the facts as they have occurred to my mind, and I have also appended a few suggestions with reference to what appears to me to remain to be done by the Society, in order to complete the course of action upon which it entered nearly 20 years ago—a course which has gradually become enlarged, and which I believe, if carried out to completion, will add not only to the present popularity of our Society, but so strengthen the body and increase the individual interest of members in its action as to place it in a firmer and more abiding position than it has ever yet attained to, at the same time that it will add to the many claims which it has already advanced, and which have obtained for it so large an amount of approbation and public support.

It appears to my mind that the secret of the Society's success since its incorporation has been the constantly progressive educational course of action which it has pursued. In reviewing the objects for the promotion of which the Society of Arts was established, I find them recorded in the address from the Council on the opening of the 93rd Session, 1846-7, (being the first address after the incorporation of the Society) as follows:—"It was the remark of our Royal President, the Prince Consort, made to a deputation from your Council when waiting upon him on the business of the Society, that the department most likely to prove immediately beneficial to the public would be that which encourages most efficiently the application of the Fine Arts to our Manufactures. The manufactures of this country have, he observed, attained an eminence for solid execution, for perfect finish, for mechanical accuracy, and for cheap production, which distinguish them in these respects beyond those of any other country. But there are some countries that excel ours in the beauty of design, in the perfection of colouring, in symmetry of form, in elegance of pattern; it is the application of the art of design to the mechanical manufactures of this country that is alone requisite to enable her to stand without a rival. Of high art in this country, there is abundance; of mechanical industry and invention an unparalleled profusion; the thing still remaining to be done is to effect the combination of the two—to wed high art with mechanical skill. The union of the artist with the workmen in general—this is a task worthy of the Society of Arts, and directly in the path of its duty." Such were the sentiments expressed by the Prince, our president; such also are the views which have guided your Council in their proceedings during the last year. They have reason to think that this is one of the most promising and valuable spheres of future usefulness to the Society. In accordance with these views, the Council recommended and issued premiums to a large amount for the production of decorative

designs and models. The result of them was, to produce a large series of models of great merit, many of which were rewarded, and some of which have been extensively manufactured and introduced into general use. The Council augur favourably from the success of their first effort in this direction, and expect increased success in the following Session. They therefore propose in this Session very much to extend their list of prizes in the department of decorative arts and manufactures. They much regret that hitherto the artist and the manufacturer have been kept so far asunder; but they rejoice that the Government has already, by establishing Schools of Design, shown its sense of the importance of combining Art and Manufacture. They believe this alienation of natural allies to be most detrimental to both; they believe that it is not vulgar art which ought to be applied to common articles of manufacture, but they believe that the higher the artistic talent called into requisition by the manufacturer the more successful it is likely to become; they believe also that one great means for the promotion of Art and the cultivation of taste, is to surround as much as possible with common objects of beautiful forms, so as to educate the people by the habit of looking on good designs and elegant proportions." To educate the people by the habit of looking at good designs and elegant proportions, was the first object to be attained by the Council, and this they endeavoured to effect by inducing manufacturers to produce articles of every-day use of simple but elegant forms, and, when combined with colour, of a harmonious and artistic character, thereby diffusing a taste and knowledge of Art, and inducing a love for the symmetrical and beautiful by supplying, in cheap materials, of elegant form, objects suited to the familiar uses of every-day life. Having succeeded in inducing the manufacturers to produce artistic designs, the public had next to be taught to appreciate and to purchase them. This object was attained by means of the Exhibitions which were then established, and the first of which, viz., an Exhibition of Select Specimens of British Manufactures and Decorative Art, was opened on the 3rd March, 1847. While pursuing the above course outside the Society, the attention of members within was directed to kindred subjects by means of papers read at its meetings, on Ancient and Modern Art, on the First principles of symmetrical beauty and their application in certain branches of the art of design, on the Harmony of colour, &c.

The success of these efforts grew day by day, and at the close of the session in 1849, we find the Society actively promoting the Great International Exhibition which was held in 1851, an exhibition, the educational value of which cannot be over-stated. But in order that the British manufacturer might not be unduly distanced by foreign competitors, the Society suggested, in the early part of the session 1848-9, that an exhibition of ancient and mediæval art should be held, "to enable the workman of our days narrowly to inspect the productions of his predecessors, executed in times, and under circumstances, which admitted of more careful artistic elaboration than do those in which we are living, and would be highly instructive to manufacturers in their preparation for the Grand Exhibition of 1851."

The Society's efforts to promote an extended knowledge of art and industry, however, did not stop here, nor was it limited to artistic designs and manufactures, for in the same year (1849), in anticipation of the Great Exhibition of 1851, a new series of exhibitions was instituted, the object of which was to place before the engineer, the mechanic, the manufacturer, and the workman, the improved appliances introduced with a view of meeting the requirements of the times, and to give publicity to the productions of "the artisans and mechanics—a class of inventors whose efforts had not at that time had the publicity given them which the Council conceived it is one of the great purposes of the Society of Arts to afford them." Nor did the

Society cease its action, or consider it had fulfilled its mission, when it had attempted to educate the people; induce manufacturers to produce; instructed the workman; and given publicity to the inventions of the artisan and the mechanic. No; new fields for usefulness presented themselves—the Exhibition of 1851 was about to take place—the scientific and artistic skill of our foreign and continental competitors was known—the appreciation of Art by the public, and the desire of manufacturers to produce more perfect specimens of industrial art, was also known; but it was felt that in this country the artist-workman was far behind his foreign competitor, and the Schools of Design were, in effect, little more than a name.

It is not necessary that I should recapitulate all the steps taken by the Society which ultimately led to the Great Exhibition of 1851; suffice it to say that, in the first instance, it found contractors who were willing to provide the necessary funds for the erection of a building, a prize fund, and all other costs and charges incidental to the undertaking; that having obtained for the object a large amount of public support, it became necessary to transfer the management of the Exhibition to a body of noblemen and gentlemen, who were incorporated for that purpose by Royal Charter, bearing date the 15th August, 1850. Of the Exhibition itself, the Commissioners state, in their first report, "of the general admiration excited by the display, it would be superfluous for the Commissioners to give any account; of the beneficial effects which may be anticipated from a spectacle so novel and so wonderful, this is not the place to speak. It will be probably long ere the impulse it has given to industry and civilisation will have reached its highest point, and it is not too much to hope that it will be ages ere that impulse will cease to be felt."

The Exhibition having been closed, we find the Society again at work, anxious to give effect to the lessons taught by the display; and in October, 1851, a letter was received from His Royal Highness Prince Albert, suggesting that in order to the attainment of those advantages to Art and Industry, which it was the object of the Exhibition to endeavour to procure, they would be best effected by a series of lectures on the probable bearing of the Exhibition on the various branches of Science, Art, and Industry. Lectures were accordingly delivered before the Society, the subject selected by Dr. Lyon Playfair for his lecture being the "Chemical Principles involved in the manufactures shown at the Exhibition, as a proof of the necessity of an Industrial Education," in the course of which he states, that, having shown in a former lecture—"On the National Importance of Studying Abstract Science, with a view to the healthy progress of industry—that a rapid transition is taking place in industry, that the raw material, formerly our capital advantage over other nations, is gradually being equalized in price, and made available to all, by the improvements in locomotion; and that industry must in future be supported, not by a competition of local advantages, but by a competition of intellect. All European nations, except England, have recognised this fact. Their thinking men have proclaimed it, their governments have adopted it as a principle of state, and every town has now its schools, in which are taught the scientific principles involved in manufactures, while each metropolis rejoices in an Industrial University, teaching how to use the alphabet of science in reading manufacture aright. Were there any effects observed in the Exhibition from this intellectual training of industrial populations? The official reserve necessarily imposed upon me, as the commissioner appointed to aid the juries, need exist no longer, and from my personal conviction I answer without hesitation in the affirmative. The result of the Exhibition was one that England may well be startled at. Wherever—and that implies in almost every manufacture—Science and Art were involved as an element of progress, we saw, as an inevitable law, that the nation which most cultivated them was in the ascendant. Our manufacturers were justly

astonished at seeing most of the foreign countries rapidly approaching, and sometimes excelling us in manufactures on our own by hereditary and traditional right. * * *

"It is well to inquire in what we are so deficient, and what is the reason of this deficiency. Assuredly it does not consist in the absence of public philanthropy, or want of private zeal for education; but chiefly rests in that education being utterly unsuited to the age. * * *

"You may, and I hope will soon, raise an Industrial University, but this should have its pupils ready trained before it adopts them."

Professor Edward Solly, F.R.S., in his lecture on the "Vegetable Substances used in the Arts and Manufacturers, in relation to Commerce," pointed out how the Society of Arts was for a long time the only public body in this country established for the promotion of Industrial Art, but also called attention to the importance of establishing an Industrial Museum, "a place of reference, in which useful knowledge of all sorts would be acceptable to every one, and at all times available for purposes of instruction;" and the Professor concluded his lecture as follows:—"With those who say that we need an enlarged and comprehensive system of national education, I agree heart and soul; but I would even go farther—I say let us have the means of teaching the schoolmaster as well as the scholar; let us, by collecting facts and useful information, obtain those means of instruction in applied science, which are at present almost wholly wanting." Such, in fact, was the universal cry raised by all who studied the Exhibition of 1851. Each lecturer, in his own special department, proclaimed the great want of England, as shown by the Exhibition, to be an increased, national, scientific, and industrial education. The Society of Arts felt the force and truth of the declaration, but it also felt that, before it could step in and aid the scientific education of the industrial classes, it was necessary that the standard of their education should be raised; and we accordingly find that the Council accepted the proposition submitted to it by Mr. Harry Chester, for establishing a Union of the Mechanics and Literary Institutions of the country, a Union which was at once effected, and the successful working and educational advantages of which, to the industrial and working classes, as well as to the Institutions themselves, has been a source of constant congratulation, both in the Council and among the members of the Society. Concurrently with this movement, the Society took steps to establish elementary drawing and modelling schools for artisans and mechanics, and appointed a Committee to carry out the object; and with this view a deputation visited Bradford on the 2nd of February 1852, in accordance with an invitation as set forth in the notice of proceedings issued to the Society at that time, and which was as follows:—

"The Great Exhibition has materially strengthened a growing conviction that one of the most serious disadvantages under which original British manufactures are produced is the want of artistic knowledge and executive ability on the part of the artisans engaged in producing them. Every one competent to judge, admits that the ornamental productions of the French exhibit much more ability on the part of the French workmen in drawing, chasing, &c., than our own. The Council believe that a radical cure for many imperfections of British manufactures, will be found in a much more enlarged and liberal system of art education than at present exists, an education which shall make the power of drawing at least as easy to be acquired as that of writing, and shall begin at an early period of life. The Council are convinced that there is hardly any handicraft in which a workman can be engaged, as a carpenter, mason, smith, &c., which would not be greatly improved by an ability to perceive the form of objects correctly and represent it with precision. At present schools of design are supported partly by a government grant, partly by students'

fees, and partly by voluntary subscriptions. Under this system most of the schools of design are in debt, and the progress of them is rendered doubtful and disheartening."

"The Town Council of Bradford, Yorkshire, a most important manufacturing centre, as yet without a School of Design, have invited a deputation of the Committee to attend a public meeting there, on Monday the 2nd of February, that the inhabitants of the borough, and persons engaged in the staple manufactures of the district of the West Riding may have an opportunity of hearing and considering the views and explanatory statements of the Council."

At the meeting which was held as above, the following resolution was carried unanimously:—"That the meeting fully recognises the great advantages derivable from a self-supporting Institution, calculated to improve the art applied to the manufactures of Bradford and its neighbourhood, and the general taste of all classes, and especially of an elementary drawing and modelling school as an integral part of it, and, in conjunction with the Council of the Society of Arts, will take vigorous measures for giving effect to the same."

A deputation also visited Halifax, where a similar resolution was passed. But the Society did not pursue this portion of its proposed action, as the Government at once proceeded to re-constitute the Schools of Design throughout the country; and I merely refer to the matter for the purpose of showing that the Society of Arts did not overlook, but was prepared to take active measures for promoting and improving, the application of the art of design to industry. About the same period the Society received and circulated the details of a plan proposed by Mr. Thomas Twining, for the technical training of our artisans, in which he referred to the various important and successful establishments in Berlin, Paris, Chalons, Angers, Aix, &c., observing "that the plan he had adopted in arranging his remarks is that which seemed most likely to render them convenient to those who might be desirous of giving a full consideration to the subject of a National College of Trade."

The Society subsequently co-operated with the Royal Commissioners of the Exhibition of 1851, in forming a Trade Museum of Animal Products, which collection is now deposited in the Museum at South Kensington.

I have stated that the Council selected from among the many propositions suggested, and pressed upon its consideration, that by Mr. Harry Chester—as affording the broadest basis for effecting the universally desired amelioration of the educational condition of the artisan and working classes. The soundness of judgment which dictated that selection, has since been abundantly evidenced, but, in order to give point and value to the educational classes in Institutions, it was necessary not only to induce the establishment of classes, but also to give a motive to continuous study in them. This the Society effected, and is still effecting, by the systems of Examinations it instituted—the prizes it offered—the Government nominations it obtained for pupils who received certificates, and their efforts were greatly strengthened by the prize which the Prince Consort offered, and which has since been continued by Her Majesty, and awarded to the student who obtains the largest number of first-class certificates and prizes during four consecutive years. This work of education and examination it has been and still is pursuing. During the ten years of its progress it has published many papers on education, and an important report on the question of Industrial Instruction. In that report, which was first published in April, 1853, and again re-issued in May, 1857, it is stated that the Council resolved "to appoint a Committee to take into consideration, and report, how far, and in what manner, the Society of Arts may aid in the promotion of such an education of the people as shall lead to a more general and systematic cultivation of Arts, Manufactures, and Commerce—the chartered objects of the Society;" and the Committee in

its report stated "that it would be absurd, for example, to suppose that any school could turn out a ready-formed machine maker; yet the labour of the mechanical engineer, in giving practical instruction to his apprentice, would be not only lightened but made more efficient, if the latter had been previously taught mechanical drawing—had learned the properties of the lever, the pulley, and the wedge, and knew the nature of and difference between cast-iron, wrought-iron, and steel; while, therefore, the practical training would be left as heretofore, it cannot be denied that a knowledge of the principles of the sciences on which arts or trades are founded is an indispensable element in the instruction of the well-skilled workman. * * * Innumerable rewards exist at present for the cultivation of classical learning—why should there not be some for the promotion of industrial knowledge?"

Notwithstanding all the efforts made, a system of industrial instruction still remains to be carried out, but the Council nevertheless considered that such had been the industrial and art progress made in this country that they were justified in proposing and succeeded in obtaining the support of the country for a second International Exhibition, viz., that of 1862. The Exhibition of 1862 was a display of Art and Industry of which England may well be proud. It resulted in placing British ingenuity and mechanical skill in a far higher position than it had ever previously attained to; its artistic powers had also increased, but the want of technical and scientific instruction was and is still felt as a necessity which must be met if British manufacturers and artisans are to hold a successful rivalry with their continental competitors in industries. The Society of Arts has accordingly again stepped forward to assist the artist workman, and by availing itself of the aids of the new and daily improving arts of chromo-lithography and photography, and also of metal casting, it has been enabled to institute a new series of competitive exhibitions for the Artist-Workman, at which exhibitions it has awarded prizes for the best productions in metal work, Ivory carvings, China paintings, wood carving, &c., &c., thus recognising the skill of the workman and placing him in the foremost rank of executive producers, and doing for him that which the International Exhibitions have done for the capitalist and manufacturer, and what examinations have done for superior intelligence in reference to primary education.

I have now sufficiently indicated, not only what the Society has done, but is doing, and it remains for me to point out in my concluding remarks what it has not done and how it may possibly carry on to completion the great work upon which it has been engaged, and to which its labours have been pointing for so many years past, I mean the institution, in connection with the Society of Arts and other bodies, of lectures and classes, conducted by Professors, by means of which instruction in Art and Science, as it bears upon industry, may be given to our future workmen, as well as to those who may hereafter become masters, manufacturers, and the employers of skilled labour.

In order to effect so important an object, and gaining experience by what the Society has done with reverence to the education of the artisan, I have naturally been led to consider what are the existing institutions of the country which might be appealed to to aid in so important a work; and in reviewing what the Society of Arts has done and is doing at the present time, I have been much impressed with the importance of developing, to as large an extent as possible, the system of co-operation with the trade guilds and companies existing in the City of London. For several years past the Society has been co-operating with the Company of Painter Stainers, which has held exhibitions in its hall and awarded prizes, to which the Society in the first instance contributed with a view to promote skilled labour in the various departments of their special industry. It last year gave aid to the Society of Wood carvers

At the present moment it is, jointly with the Company of Coach and Coach Harness-makers, affording its patronage to the workmen engaged in that trade who are about to hold an exhibition of the products of their skill and industry. Out of London it has contributed to a prize fund for the promotion of improved design and increased skill and ingenuity on the part of the Whitby jet-workers; and the question at once arises, would it be possible to induce a combined action on the part of the 80 City companies, the Chambers of Commerce, and other bodies in aid of the industrial education of the youths of the present day, as well as to encourage the skilled workman by the offer and award of prizes in each of their respective industries.

The Society of Arts has already begun the work, both by awarding prizes to skilled workmen and the institution of lectures on the application of science to industry; it will doubtless continue and extend its action in both directions; but to attain real instruction in science, more than lectures are necessary. Classes under competent Professors must be formed, if industries are to be benefited. At the close of the Great Exhibition of 1851, in order to attain more education in technical knowledge, it was said that the effort should be made to educate downwards—to give less classical and more practical education. The Society did not accept that proposition, but, beginning with the working classes, has been endeavouring to educate them upward; and now that its examinations have enabled their education to be tested and the fitness of youths to be advanced into classes where they may acquire precise knowledge as affecting industries, one of the difficulties in the way of the establishment of classes for industrial instruction is got rid of. The certificates of our own examiners, of those awarded at the Oxford Middle Class Examinations, which arose out of our own action, of the London University and others, should be the passport to our industrial classes.

If, then, the City Companies could be induced to co-operate with the Society of Arts in establishing a system of instruction and a test of the degree of knowledge acquired by those who are apprenticed by their corporations; if they would assist and co-operate with the Society of Arts, by offering and awarding prizes to the skilled workman, the Society might again create for the benefit of the public, Annual Displays and Exhibitions of the Products of British Industry, to which British manufacturers might send selections from their yearly commercial products, not advertising specimens got up for great exhibitions regardless of cost; the patented and mechanical inventions of each year might also be added, as well as samples of raw produce and imports, or selections from them. To effect the latter object it might be necessary to urge upon government the propriety of its doing for commerce what it already does for literature, by compelling the deposit in our national library of a copy of each work produced for sale; in like manner it might compel the deposit, when required, of samples of new imports.

Thus we should have an aggregation of the products of Arts, Manufactures, and Commerce, from which to select specimens for a National Trade Museum, which would again form the basis for a continued course of industrial instruction.

But it may be said, even admitting the desirability of the proposition, how can the Society of Arts, which is already limited in its powers of action by the want of space, provide the necessary accommodation for so extended a sphere of action? My answer is, the founders of the Society of Arts, believing that the institution of the Society and the promotion of the objects for which it was founded, would be a national benefit, appealed to the public for funds for the erection of the premises in which its business is at present conducted, and obtained them. The Society of Arts in our own day, believing that the International Exhibitions of 1851 and 1862 would be a public advantage, appealed to the public for the necessary funds and obtained them; and, believing in the national importance of the work in which the Society of Arts is at present engaged,

I have no doubt that the members of the Society and the public would respond to an appeal for funds if a comprehensive scheme supported by the co-operation of the City Companies and others, were placed before it. I also believe that the Society, which has an equitable claim to a portion of the surplus profits arising out of the Great Exhibition of 1851, a claim which it has never yet pressed upon the Government and the Royal Commissioners, might fairly advance such claim now the country has become possessed of a large portion of the estate purchased with that surplus and handed over to the government, as has been publicly stated at a price far below its market value.

Let the Society of Arts proceed then in its onward course, let it act the part of broker or middleman with energy; it knows what is the demand on the part of the public; it also knows how to obtain a supply to meet the demand. To hesitate or delay action, is to fail in its duty; to supply the demand is to add new honours to those it has so deservedly won during the century and upwards of its existence.

PRIZES TO ART-WORKMEN.—It would ill become me, as an officer of this Society, to criticise or express any opinion upon the various articles which have this year been received in competition for the Prizes offered to Art-Workmen; that is one of the duties which will be discharged by a Committee appointed by the Council; nor is it necessary that I should enter into any lengthened statement relative to the course which the Society has adopted relative to the offer of those prizes. Invited in the first instance, to co-operate with the Company of Painters Stainers for the offer and award of Prizes in promotion of their special industry, it was natural that other bodies, seeing the success which attended the efforts of that Company, should desire to apply a like stimulus to their own trades.

Accordingly, we find the Society of Wood Carvers applying to the Society of Arts to co-operate with that body in the offer and award of Prizes for the promotion of their special Art industry, and the Exhibition of Wood Carving, held in June, 1863, was the result.

The Council of the Society of Arts, seeing that there was a growing desire on the part of the Art-workmen to come forward and compete for honours in their several handicrafts, appointed a Committee, in March, 1863, "to consider and report what prizes the Society should offer for the encouragement of Art-workmanship applicable to manufactures," and, upon the recommendation of that Committee, the Council decided to offer prizes for the successful rendering of designs in the undermentioned processes of manufacture, according to the directions detailed in each case.

1. Modelling in terra cotta, plaster, and wax.
2. Repoussé work in any metal.
3. Hammered work in iron, brass, or copper.
4. Carving in ivory.
5. Chasing in metal.
6. Enamel painting on metal, copper, and gold.
7. Painting on porcelain.
8. Inlays in wood (marquetry or buhl), ivory, or metal.
9. Engraving on glass.
10. Embroidery.

The designs will be by artists of great reputation, to be translated into the various modes of workmanship; and photographs and castings of such designs will be sold by the Society, at the Society's House, at cost price, to persons desiring to be competitors."

In accordance with the above recommendation, a list of prizes was prepared and issued in May, 1863, and in October of the same year 72 works were received in competition. The works received were exhibited in the Society's room; and a list of the prizes awarded will be found in the *Journal* (See Vol. 12, page 75).

The success of this the Society's first effort, in connection with general Art industry, was so far satisfactory as to induce the Council to prepare a second list of

subjects, the response to which will this evening be seen and judged of by the members.

I cannot conclude these remarks without congratulating the Society upon the continuous and steady growth of a desire on the part of the industrial classes to come forward and exhibit specimens of their skill and industry—a desire which has been abundantly evidenced by the Exhibitions held in South Lambeth last year, and more recently in the North of London. Other exhibitions of a like character are announced as about to be held in Marylebone, in Lambeth, and also by the workmen employed in the coach-making trade.

In connection with the latter Exhibition the Society of Arts has offered some special prizes, which will be competed for in February next. A list of these prizes is given below. The Exhibition will take place in the hall of the Company of Coach and Harness-makers.

OPERATIVE COACHMAKERS' INDUSTRIAL EXHIBITION.— SPECIAL PRIZES.

The Committee have great pleasure in submitting the following as a list of the Special Prizes promised up to the present time:—

The Society of Arts offers a prize of £10 together with the Society's Silver Medal, for the Best Set of Working Drawings for a Private Carriage, showing the construction of its various parts. Scale 1 inch to the foot.

Also £5 for the Best Specimens of Heraldic or Ornamental Chasing in Silver, Brass, or Copper, suitable for Carriage or Harness.

Also £5 for the Best Specimens of Heraldic or other Metal Ornaments produced by Electro deposit, suitable for Carriage or Harness Ornamentation.

The Worshipful Company of Coach and Coach Harness Makers place three Bronze Medals at the disposal of the Judges.

Also the Master of the Company (Thomas How, Esq.) offers £5 for the Best Design of an Open and Close Carriage combined. Scale 1 inch to the foot.

Mr. G. N. Hooper offers Three Guineas for the Best Drawing of a Town Barouche, on under and C Springs. Scale 1 inch to the foot. Open to foremen, carriage operatives, and apprentices.

Also Two Guineas for the Best Drawing or Model of a Light Hospital Carriage, to convey the sick poor. Open to all comers.

Mr. G. A. Thrupp offers Two Guineas for the Best Stuffed and Quilted Carriage Cushion in blue Morocco leather. Open to coach trimmers only.

Also Two Guineas for the Best Drawing in Pencil, upon Paper (half the full size) of an Under Fore-carriage for Elliptic Springs, of usual or original design. Open to apprentices and improvers.

Mr. J. F. Woodall offers Two Guineas for the Best Specimen Panel of Carriage Painting, eight Plain or Ornamental.

Also Two Guineas for the Best Finished Pad and Bridle, for Pair-horse Harness. Open only to harness makers working in carriage factories.

Also One Guinea for the Best Covered Carriage Dash-Iron sewed by hand.

Mr. Barlow offers Three Guineas for the Best Working Drawing (full size) of Ornamental State Lamp, of New Design, suitable for a Coach for Chaiot.

Also Two Guineas for the Best Full-size Model of Brougham or Barouche Lamp, of New Design, uniting perfect ventilation and reflecting powers, to burn candle, oil, or other material.

Also Two Guineas for the Best Complete Set of Full-size Working Models of Furniture for Pair-horse Harness, of New Design. (Chased work not to be introduced.)

Or One Guinea for the Best Complete Set of Full-size Working Drawings of Furniture for Pair-horse Harness, of New Design. (Chased work not to be introduced.)

Also Half a Guinea for the Best Six Full-sized Models

or Twelve Full-size Working Drawings of Bridle Fronts, of New Design. (Chased work dot to be introduced.)

Also Half a Guinea for the Best Six Full-sized Working Drawings of Bridle Rosettes, of New Design, Chased or otherwise, from $2\frac{1}{4}$ to $2\frac{1}{2}$ inch diameter.

Also One Guinea for the Best Six Full-size Models or Twelve Full-size Working Drawings of Carriage Door Handles, of New Design. (No chased work to be introduced.)

Also Half a Guinea for the Best Specimen of Hard Solder Plating (silver or brass).

Also Half a Guinea for the Best Specimen of Soft Solder Plating (silver or brass).

The Committee offers—

For the Best Set of Working Drawings of Improved Street Cabs.

For the Best Specimen of Heraldic Painting.

For the Best Specimen of Decorative Coach-carving.

For the Best Set of Working Drawings for an improved Under Fore-Carriage for a Brougham, combining lightness and strength.

For the Best Specimen of Ornamental Carriage Painting, Imitation Pedestal Painting, Sham Caning; also for harmonious combination of Colours and perfection of surface.

For Parts of Harness, Improved, of Full-size or in Model-size, or the Best Design of improved Harness.

For the Best Covered Carriage Dasher, or Wing, or Seat Border, sewed by hand or machine.

For the Best Method of Detaching Fallen Horses quickly, either in front or rear.

For the Best Cushion, Stuffed and Quilted in any Material.

For the Best Design for New Mode of Trimming a Carriage Door.

For the Best Design for a Hammercloth, combining good effect and economy in cost.

DISCUSSION.

The CHAIRMAN said it was now his duty to invite discussion on the paper they had just heard read. The attendance this evening, and the manner in which the paper had been received, convinced him that the members appreciated, as he did, the great zeal and ability with which Mr. Davenport discharged his duties as an officer of the Society. He could not refrain from paying this tribute to him on an occasion when no doubt a great many of his personal friends were present. On previous occasions he had expressed himself with regard to the good fortune of this Society in being represented by three officers, all of whom possessed considerable talent, and who not only exercised their talent for the advancement of the best interests of the Society and the objects for which it was established, but who also contributed, by unity of purpose and action, in a most remarkable degree to the advancement of all those great objects for which the Society was established. He hoped the discussion would show that the members appreciated those services, and that the action of the Council for the last ten or fifteen years, in endeavouring to reform the education of the middle classes and of the Art-workman, was in harmony with the requirements of the times, and would meet with the hearty support and co-operation of the members at large.

Mr. H. COLE, C.B., remarked that there was one paragraph in Mr. Davenport's paper with which he could not agree. That was with regard to the Government compelling the deposit in some national museum of a copy of each manufactured work produced for sale. He thought Mr. Davenport was mistaken in supposing that Government could compel people to make such a deposit. For his own part he should be sorry to see any such compulsory law as that hinted at. Indeed, he thought it was not creditable in the present day that there should be a law compelling authors to deposit gratuitously copies of their works in the library of the British Museum and

other public institutions. It was not an agreeable thing for a public officer, in the exercise of his duties, to be constantly summoning publishers to the police-court for not conforming to the law in this respect. He believed it was detrimental to literature, and he conceived it would be so to manufactures; and further, he felt certain that to build a huge Babel to hold specimens of the character named—good, bad, and indifferent, as the case might be—would be the most tiresome and uninteresting to visitors. He would now turn to the Exhibition arranged for inspection to night, and he must congratulate the competitors upon it. Although he had been unable to do more than take a cursory view of the objects, he felt assured that a considerable advance had been made in the quality of the work over that of last year. He had no doubt this idea of inducing artist-workmen to exhibit specimens of their handicraft would be fruitful. It would go on increasing, as was the case with the Royal Academy, which more than a century ago had started from small beginnings. In the outset of such a work as this, however, no doubt there would be some errors in detail which might require amendment, more especially as to the conditions attaching to some of the prizes offered. He feared that these conditions in some instances had perhaps prevented the sending in of so many specimens as might have been expected. For instance, a dozen casts of the bust of Clytie had been sold to workmen, but one only had been finished and sent in. This led him to fear that there was some condition connected with that matter which impeded competition. It might be that the bronze was not delivered in time for the work to be done in the workman's overtime, for it should be remembered that these things were executed in the workmen's overtime. He hoped the same bust would be competed for next year, so that the labour of those who had bought the cast this year might not be thrown away. Then again it might be considered that the works which the Council had put forth to be done were not such as when finished would be saleable commercial articles. That was no doubt partially true, though in their selection the Council had endeavoured to bear that principle in mind. He thought, however, he saw among the articles exhibited some which might properly be bought for the South Kensington Museum, and he hoped the Lord President would take that view. As an individual member of the Society, it occurred to him whether, in the selection of objects to be presented for execution in their next programme, it would not be well to take the workmen themselves into consultation, and ascertain which they would suggest as most fitted for the purpose; and he also thought the object might be still further promoted by a little co-operation on the part of those who were interested in special manufactures. He thought the Council would do well to receive suggestions from those quarters as to the subjects to be selected for competition. He would only further remark, that though some of these articles now exhibited might not be immediately saleable, yet he believed in many instances they would be the means of producing commissions for the producers of such articles. He might state that at South Kensington wood carvings were wanted, and he saw specimens this evening which led him to think that the persons who executed them might be called on to do something for that national establishment. He was gratified at seeing indications of a new branch of industry springing up, viz., glass mosaics. The heads exhibited this evening were the first publicly exhibited specimens of glass mosaics by English artisans he had ever seen. He considered these worthy of great attention, as he was satisfied before many years there would be a very extensive application of glass mosaics for decorative purposes. He had reason to believe that more than one of these specimens had been produced by females. It was a branch of industry in which that sex might be well employed, and he would only throw out the hint to those who might hereafter de-

sire to engage in it, that, as an indispensable preliminary, they should possess a sound knowledge and power of drawing.

Mr. D. ROBERTSON BLAINE had listened with great pleasure to the admirable paper; and his single objection to what had been advanced in it was confined to that part which had been alluded to by Mr. Cole, the compulsory deposit of specimens of manufactures at the expense of the manufacturers themselves.

The CHAIRMAN, quoting the passage of the paper referred to, said the suggestion only applied to "new imports" of raw materials employed in manufactures.

Mr. BLAINE said the suggestion was an admirable one, if it were done at the expense of the Government; otherwise he took exception to it. In the case of the precedent that had been quoted, viz., on the compulsory deposit of copies of literary works in public libraries, he knew it operated in many cases as a great hardship upon authors and publishers, especially in the case of the more expensive works. If they wanted copies of works to be deposited, he thought the Government and the universities ought to pay for them. With regard to the many beautiful works which they saw before them, they afforded illustrations of the rapid advance which was making in Art-workmanship in this country. He referred with great satisfaction to the testimony borne by the French artisans who visited the Great Exhibition to the great progress made in this branch of industry by the workmen of this country. That was one great proof of the benefits of international exhibitions. The French people were now pressing upon their government the importance of following the example of this country in promoting schools of art, because they saw the wonderful progress which had been made in England since the Government Schools of Art had been established.

Mr. PETER GRAHAM, referring to the selection of the special objects for execution, remarked that he regarded this as a necessary step, in the first instance, as serving for a guide to the competitors as to the class of works on which their skill should be exercised. On future occasions he thought more scope might be allowed, and that workmen might be permitted to bring their original works as proofs of talent in design, as well as power of execution. It was due to Mr. Davenport to thank him for several excellent suggestions he had thrown out in his paper. It would be a most desirable thing to obtain the co-operation of the wealthy City companies and guilds; take, for instance, the Goldsmiths' Company, he thought it was rather a reproach to that important company that it had not come forward to encourage by prizes the development of those beautiful arts with which it was identified. It possessed immense wealth, and he did not know how it could promote the interests of the guild, or do anything more creditable than to offer prizes in every branch of the goldsmith's art. The same remarks applied to other companies. One of the poorest and most obscure of those guilds, the Painters Stainers, had been the first to set an example in this direction. He had not yet minutely examined the collection of objects before them, but he could see at a glance that there was a great advance upon the display of last year; and no doubt if it was carried on in a right spirit they would see improvement year by year, till the art workmen of England were equal in execution to those of any other country in the world.

Mr. WINKWORTH said that he thought his friends Mr. Cole and Mr. Blaine had occupied too much time in discussing a point which was not important to the immediate object of the paper, and respecting which they had not quite apprehended Mr. Davenport's precise meaning. He had not, as they supposed, approved the policy, amounting to confiscation, of compelling authors to deposit copies of their works at the British Museum, the Universities, and other public institutions; but, assuming that it was to continue a law of the land, might it not be usefully extended, in the way suggested in his paper, to the pro-

motion of Art-Manufacture education? He (Mr. Winkworth) also doubted whether, as the articles in and around the room which had attracted so much attention—and to some extent admiration also—were sent in competition for prizes, it was judicious or fair to anticipate the awards of the adjudicators hereafter to be appointed, by specially noticing certain specimens of art in the room which, in the opinion of the speaker, Mr. Blaine, were beautifully designed and executed. He would now recall the attention of the Society to the paper which had so much interested them, and justly so. Mr. Davenport had favoured them with a well-digested historical epitome of the action of the Society in the direction of industrial education, and in so doing could not fail to pay a tribute of recognition to the services Mr. Harry Chester had rendered to the cause of adult education in all its branches, by suggesting and initiating a system of competition which had borne most gratifying fruit, and the benefits of which were being daily extended. That which he had organised might be introduced into a sphere of education which should give to the artisan a kind of technical knowledge, of which English workmen were for the most part ignorant or were only partially acquainted. He had in his paper suggested several new directions, as, for instance, lectures and classes, conducted by professors, by which instruction in art and science, so far as they bore on skilled industry, might be properly communicated; and one original way in which this might be encouraged, the action of the trade guilds and companies, might be invoked, as in the case of the Painters Stainers' Company and others. To this he (Mr. Winkworth) cordially assented, but Mr. Davenport should not indulge the hope that the suggestion would meet with universal acquiescence, for it must not be forgotten that many of these corporations had outlived the trades for the promotion of which they were ostensibly established. Who, for instance, could tell them what was the particular craft originally contemplated by the Loriners' Company? Others, again, as the Fishmongers' and Spectacle-makers', did not seem to afford scope for the offer of prizes for new discoveries or appliances in their particular branches of trade. The bulk of the members of many of the City companies had in fact no idea of the crafts they were apprenticed to learn, and the secrets of which they were sworn not to divulge. Others again had no funds that could be legally diverted to objects external to their own. But, on the other hand, the City companies were in the aggregate wealthy and patriotic, and whether their own specialities afforded scope or not for the offer of prizes to elicit talent in the cultivation of them, they would no doubt, if suitably approached, be found willing to contribute of their abundance towards objects so legitimate and praiseworthy as Mr. Davenport in his paper had so luminously pointed out. He had only in conclusion to repeat that he felt much indebted to Mr. Davenport for his well-arranged and well-digested paper on topics at this moment so generally interesting, and he confidently anticipated that the result of the discussion would be to affirm the propositions he had submitted, and to suggest means for carrying them out.

Mr. GEORGE GODWIN, F.R.S., could not allow the last observation to pass without comment, as he confessed he did not take the same satisfactory view of the objects exhibited which the hon. gentleman who preceded him had done. That it was much better than the collection on the previous occasion there could be no question, but that it came up to the inducements held out by the Council of the Society he was unable to say. Premiums to the extent of nearly £600 were offered by the Society for objects in all these branches of art industry, and though there were many excellent works in the collection, he was afraid when the majority came to be critically examined, a small portion only would be found entitled to high commendation. The inference to be drawn was that there was something more to be done than the mere offering of prizes. They had to labour to induce a greater appreciation of the necessity of education. Looking at the means

now afforded to working men and to those above them, it seemed to him discreditable that the response to the invitation had not been greater. During the last few months he had been frequently called upon by old workmen, journeymen carpenters, bricklayers, and plasterers, for advice as to what they could do for their sons, in order to get them out of the fixed drudgery in which they themselves had been compelled to labour for so many years. His simple advice was, and he wished the hint might find its way into the workshops of this country, let them learn drawing. There were schools of design throughout the metropolis, and in nearly every large town. If it was necessary, the parents must make a little sacrifice to enable their children to do this. In so doing they would make their children to rise above their own position. Their course was easy; schools of design were plentiful; competitions were open; there were the examinations and prizes of the Society of Arts; and there was a wide field open for the development of the fine arts for decorative purposes, domestic and ecclesiastical. The moment a man showed ability he was sure to be taken by the hand, and to raise himself a step beyond the position in which his father was toiling. They wanted in addition, however, some little effort on the part of manufacturers and from the large builders. He thought the system of apprenticeship had been too much neglected. It should be urged upon the large builders and others that they should aid their men in pushing forward their sons; that they should take the sons into their establishments, and enable them to gain a superior position in their trade. It was a lamentable fact, that notwithstanding what had been already done, the great body of artisans of the present day were universally inferior to the artisans of 70 years ago. They could not get the same number of good bricklayers, or an equal number of carpenters with the same amount of geometrical knowledge as formerly. The system of contract work had led to a demand for quantity rather than quality. The absorption of various trades into one person's hands, in the shape of contractors, had destroyed emulation, and stood in the way of the small masters. As an instance he referred to the fine plastering which was to be seen in some of the older houses in London. There were not men now to be found to do this work. It therefore behoved this Society to go on in its course of stimulating the education of the artisan. At the late Exhibition of the Architectural Museum, only five specimens were sent in for competition for prizes, varying from £5, £10, to £20, and none of these possessed sufficient merit to induce the Council to award the prizes offered. That showed how small the response had been there; and it was small on the present occasion, taking into consideration the large sum offered in premiums by the Society of Arts. The notion had been entertained by himself and others that it would be well to invite the skilled artisans of London to a conference in this room, in order that they might state why they had not competed more largely, and under what circumstances they would compete? Such a proceeding would put them in possession of facts which would enable them to obtain larger results. What was sought for by these competitions was the encouragement of a more intimate union between the fine arts and the useful—the wedding of Venus and Vulcan. Speaking of the latter, he was sorry to note how small was the response as regarded hammered iron and brass work. It was ridiculous that there should be only two or three small specimens of this description of work sent in in response to the appeal that had been made. He was sure all present would thank Mr. Davenport for his paper. He was not certain that they could look to the great City companies for more than pecuniary aid; but the competitors would require to be assured from the beginning that those who were to be the judges of their work had some practical acquaintance with it. Companies were not qualified themselves to be the adjudicators of the prizes, because the workmen would not have confidence in their

judgment. With regard to lectures, they were important and no doubt valuable, but they would not alone make good artisans or good workmen. There must be actual practice in the studio and the workshop.

Mr. B. WATERHOUSE HAWKINS would venture to support the suggestion made by Mr. Cole and repeated by Mr. Graham, viz., giving a little more liberty in the conditions of the competition, to the extent that while certain photographs and models might be selected as the type of the work to be performed, the workmen should be at liberty to enlarge upon the original design, that it might be employed in the decoration of some article of utility, so that the person who succeeded in that direction might find his reward in having produced an article, which in itself would be saleable, and not a mere abstract work of art. In the production of these works, it must be remembered that the artisan occupied his time after the ordinary hours of labour, and hence he thought the time allowed was scarcely sufficient. The greater part of the work could only be performed during the evenings in summer time. He was inclined to think that by giving a longer time they would have a larger collection of works sent in.

Mr. THOMAS JONES, with reference to the co-operation of the City companies, remarked that so far from the Goldsmiths' Company assisting in the production of works of art, their practice in testing the purity of the metal employed, and sent to them for that purpose, did much injury to them. Works of excellent truthfulness and perfection of form sent there to receive the certificate of the company that the material was of a given standard, were, from the manner in which they were treated, unnecessarily disfigured, and rendered unfit for sale until they had a second time passed through the hands of the workman. It would be a great benefit if this Society could become the means of inducing that distinguished company to treat the works of art confided to them a little more carefully. It had been stated that the Painters Stainer's Company had been the first in the movement of promoting competition of the character under discussion this evening. He, however, believed it was the Linners' Company to which that honour belonged. Unfortunately, however, the effort was discontinued, in consequence of a feeling on the part of some of the members of that guild that the funds ought not to be diverted to the rewarding of persons outside their own pale.

Mr. P. L. SIMMONDS cordially approved of the suggestion of Mr. Davenport, that raw materials of commerce should be deposited with the Society, for the purposes of scientific examination and report. There was at present no convenient public place of deposit where such articles could be seen and examined. He knew many new oil-seeds, fibres, gums, paper materials, &c., were received by brokers and merchants in this great commercial port from time to time, which were either entirely overlooked or but little appreciated, and yet many of these might become most important for manufacturing use. Mr. T. C. Archer had a few years ago read a paper before the Society "On some New Articles which had come into Commerce in the Port of Liverpool," but they scarcely ever heard of the new articles which were received in London. The Society had already been the means of introducing to public notice many valuable articles of commerce, such as gutta-percha and Balata gums, Indian silks, new oils, &c., and could do much more good if specimens were deposited for examination by importers and others.

Mr. PHILIP PALMER said the object of the co-operation of the City companies had been introduced by him at the first meeting of the session. He would follow up what he then said by adding, that in the observations he submitted, he did not mean that companies should institute separate competitions or separate exhibitions, but that they should render their assistance to the competitions of this Society. In this respect he apprehended there would be no great difficulty in obtaining the co-operation of such

companies; for instance, the Mercers' Company might contribute prizes in connection with textile fabrics. The Grocers' Company might render their assistance in the matter of colonial productions, as suggested by the observations of the last speaker. The spectacle-makers' operations might, he apprehended, be extended to the whole range of optical instruments. He agreed with Mr. Godwin that it would be a great advantage to all branches of trade that a proper apprenticeship-system should be established.

Mr. JOSEPH ASH stated his belief that the small exhibition in wood carvings at the Architectural Museum, alluded to by Mr. Godwin, arose from the almost entire absence of practical working men in the Council of that Institution, who acted as the adjudicators of the prizes. He thought it of the utmost importance that the competitors in such competitions as these should have confidence that the merits of their works would be decided by a competent tribunal of practical men.

Mr. GEORGE LOCK claimed to be the originator of the scheme for prizes in wood-carving which had called forth the present competition in that department; and he begged permission to say a few words on points which had been suggested by this and the preceding display. He agreed with the last speaker, that the paucity of specimens at the Exhibition of the Architectural Museum was in a great measure due to the cause which had just been pointed out; and he suggested that in these exhibitions it should be a condition, that the jurors appointed to decide on the merits of the competitors should include a fair proportion of practical men in each branch of the subjects. He felt if that was not done these competitions would suffer. With respect to the subjects selected by the Council for the wood carvings, he believed there was no cause for complaint, inasmuch as in addition to the models and photographs issued, there was in the programme this year a series of prizes offered for original works in wood carving, no design or model being prescribed. Complaint had been made on the part of a few employers, who were not themselves Art workmen, with regard to the indefinite period for which the articles were required to be left in charge of the Society. Some tradesmen considered it an inconvenience to lose a portion of their stock for a lengthened period, and he thought it a matter worthy of consideration previous to the next competition. From some quarters he had heard complaints of want of proper information from the officers of the Society. He did not mention this as implying any neglect on the part of the officers, for he was quite aware of the vast amount of extra labour which these exhibitions entailed upon them. Another point he would suggest was a more extended publicity being given of these competitions; and with that view he suggested that they should be advertised in those newspapers which were mostly read by working men. The mere announcement in the Society's *Journal* was not sufficient, as that publication was not seen by working men. He had been told by one of the promoters of the North London Exhibition that not one of the fifty persons who acted with him had heard of this intended competition. He concurred in the suggestion that the competitors should to a certain extent be consulted as to the subjects which should be selected as models on which they should exercise their skill. Mr. Lock then alluded to the proceedings of the Society in respect of its competition of a similar character to this in the latter part of the preceding century, when the sculptors Banks, Nollekins, and Bacon were among those receiving rewards. The last-mentioned artist succeeded in carrying off several valuable prizes, and the advantage of the system to him in after-life was acknowledged in a letter to the then Council of the Society. In conclusion, Mr. Lock expressed a hope that the Council would consider the desirability of exhibiting ancient works of art in connection with this display of the articles sent in competition for prizes. He believed that such a course would give additional interest, and would be of great value to the competitors and Art-workmen generally.

Mr. H. HALE said one reason why the response on the part of the wood-carvers had not been more extensive was to be found in the fact that that class of workmen had been so much occupied by the pressure of business of their employers during the last year, that they had no leisure to prepare objects for this exhibition.

The CHAIRMAN said, the time having arrived for closing the discussion, he thought Mr. Davenport might congratulate himself on his paper having elicited one of the best and most useful discussions of the session. There were, however, one or two observations, especially those of Mr. Lock, which required some notice from him as Chairman of the Council. Mr. Lock had stated that complaints had been made in some quarters of the length of time the specimens were kept in the Society's charge, and that whilst such specimens were kept out of stock they might become unsaleable. Now, with regard to articles taken out of a tradesman's stock, if that were known to be the case they would not be admitted to competition, for it was not the object of the Society in these competitions that persons should compete who were able to keep works in stock, and employ others to do the work. The great object was to do for the Art workmen in his special handicraft that which had already been done in another direction in testing the knowledge of candidates by the examinations instituted by the Society. The Society sought to stimulate the Art workman by giving opportunities for testing his skill, and by placing before him models and photographs of the best examples in each branch of industrial art. With respect to the character of the subjects and the conditions of the competition, he might state that out of the 97 articles sent in, 34 were in connection with that division of the programme in which no restriction was laid down as to choice of subject, and for which no examples were prescribed. The competitors were free to do that which they thought best suited to their individual talents and powers. He could not help alluding to the beautiful carving of the head of a child behind him, in illustration of this statement. No model or photograph was furnished for that beautiful work. Having referred to some other works exhibited, the Chairman went on to remark upon the co-operation of the City companies in this work. He said it was a difficult but an interesting question. Taking the twelve leading companies in their order of seniority—the Mercers, Drapers, and Grocers—might be asked to offer prizes for the finest productions of the loom in all the branches of textile fabrics. Again, the Fishmongers' Company might be brought into the field. The most beautiful of old china was replete with forms of animals in all sorts of relief. That company might offer prizes for the best designs in earthenware or china exhibiting the best drawings of the denizens of the seas and rivers of this country. Of the Goldsmiths' Company he need say no more, now that it was to be hoped that instead of converting watch cases into cocked hats they would test the quality of the gold and allow the beautiful work of the lathe or the tool to be returned to the owner, uninjured, and offer prizes for the best specimens of chasing or of ornamental jewellery. The Vintners' Company again might, in like manner, do their share in this good work, and encourage the artistic embellishment of metal work, by offering prizes for ornamental designs, in which the beautiful stem, leaves, and tendrils of the vine might be most elegantly introduced, and with which many of the most beautiful ancient bronzes were ornamented. In this way something might be done by the great majority of the City companies, but it could only be effected by great attention and labour on the part of the Council, and whether they would have time to enter upon it during this year he could not at present say. It was a pleasant thing to the Council to hear a certain amount of fault found with these proceedings, and to have attention directed to any weak points in the system by so friendly yet so powerful a critic as Mr. Lock. He believed, however, they were in the main fulfilling the

wishes of the members in the course they had pursued with respect to these Art workman prizes; and when it was said that intending competitors could not gain the necessary information from the officers to enable them to send in their works in time, he was sorry that such a statement had been made, as he was convinced some misunderstanding must have occurred, for no workman could have applied to Mr. Foster or Mr. Davenport without obtaining the fullest information it was in the power of those gentlemen to give. Another observation required remark, viz., that relating to want of sufficient publicity being given to the rewards offered by the Society. He believed Mr. Lock did not know what had been done by the Council, who had distributed bills containing their programme very freely among the principal workshops; and to prove that the workmen were aware of the competition, he would state that nearly 600 copies of the photographs and engravings had been bought by the workmen at the Society's house; and further, with respect to the insufficiency of the time allowed, he would add that the notices were issued in February for works to be delivered here in the November following. Then, with respect to the time the articles were delivered, and the period which elapsed between the exhibition and the adjudication of the prizes last year, he must say that the works were not sent in till June, and they could not name a day for the distribution of the prizes until the Prince of Wales became the President, and appointed a day for that purpose; and he believed the recipients of the awards were more gratified at the honour of receiving them from the hands of his Royal Highness, than disappointed on account of the time they had to wait for them. On the point referred to by Mr. Godwin, who spoke from his own knowledge, which was very extensive, that the workmen of the present day were not equal in skill to those of seventy or eighty years ago, he thought that remark required some qualification. They might not be able to get plasterers to do the splendid work which they saw in some of the old city halls. It was a description of work not executed now, because the most beautiful forms of ornamentation were produced more quickly, and they could not afford the time for it. But if they tested the skill of the workmen as a whole—in the precious metals, in plate, in china painting, or the works of the loom, they knew that the French artists had expressed their surprise at the wonderful progress made in this country.

Mr. Godwin said the remark he had made applied merely to building operations.

The CHAIRMAN said that he would carry his remarks no further, but he would ask the meeting to thank Mr. Davenport for his very interesting paper, and to congratulate him on the interesting discussion which had followed the reading of that paper.

The vote of thanks having been passed,

Mr. DAVENPORT in acknowledging the vote of thanks said in reply to the observations made by Mr. Cole and Mr. Blaine, that the idea which he intended to express was this—if Art, Manufactures, and Literature, are beneficially promoted by the protection which the government of the country gives to the author, the artist, the designer, the manufacturer, and the mechanic, by means of the Copyright Laws, the registration of Designs Act, and the Patent Laws, in each of which cases where a monopoly is granted, a copy of the design or specification of the article to be protected, is deposited for the information of the public in some duly appointed repository, might not the Government, with equal justice and advantage, be asked to give to the person who discovered in a foreign country products fitted for and applicable to industries, be enabled to obtain a right of import from such country of the product which he had discovered, and of which he was the first and the true importer; and in consideration of such right being granted he might be required to deposit samples of the product, which could be deposited in a National Trade Museum. He never for

one moment contemplated the desirability or possibility of Government compelling manufacturers to deposit copies of the works they produced. In thanking the members for the full discussion which they had given his paper, he would add that his object in writing it would be fully attained if the interests which the Society was established to promote, could be advanced one step by the adoption of any of the suggestions made in the course of the discussion.

ROYAL SCOTTISH SOCIETY OF ARTS.

FORTY-FOURTH SESSION. THIRD MEETING.

The Society met in their hall, 117, George-street, Edinburgh, on Monday, the 12th Dec., at 8 o'clock, p.m. Charles Cowan, Esq., of Logan-house, President of the Society, in the chair.

The following communication was made:—"Exposition of the late Researches on the Cohesion Figures of Liquids," by Thomas Thethill Wright, M.D., &c., with illustrations by the oxy-hydrogen light.

Dr. Wright stated that, on being requested to give one of the "Special Discourses to the Society of Arts," he had chosen the subject of the "Cohesion Figures of Fluids," as he was desirous of bringing before the practical men assembled at the meeting the remarkable researches of Tomlinson, as well as observations made by himself in the same field. The lecturer then proceeded to give a very full exposition of Tomlinson's discoveries, with numerous carefully executed drawings of the cohesion figures of various oils and other fluids when dropped upon surfaces of water and other liquids, figures which have already been exhibited by their discoverer at the Society of Arts in London in his paper read before it. Dr. Wright then proceeded to describe two new classes of cohesion figures discovered by himself:—1st. Figures produced on perfectly clear and freshly split surfaces of mica; and 2nd. Figures produced by drops of fluid on surfaces of mica or glass, when connected with the poles of an induction-coil. He showed, by the oxy-hydrogen lantern, on a screen twelve feet in diameter, images of both these classes of figures, as well as numerous drawings of microscopic figures which were too small to appear on the screen. The mica figures were produced by placing a large drop of fluid (sulphuric acid, nitric acid, tinctures of iodine, henbane, vegetable infusions, and a great variety of animal fluids and mixtures of them) on the surface of the mica, and gently breathing on them, when the cohesion figures instantly developed themselves in an infinite variety of forms. Those shown on the screen consisted of an infusion of the extracts of belladonna, senna, and hemlock, and of healthy urine, urine containing bile, and urine containing albumen. These figures were rendered visible, developed as it were, by dusting them with a powder-puff containing hair-powder or the finest lamp-black. Dr. Wright pointed out that all these figures presented a distinctly bisymmetrical form, and imitated, with remarkable clearness, the forms of various microscopic algæ and diatoms; while some of the images of urine, developed with carbon, in addition to their branching forms, were minutely veined, so as to resemble the finest specimens of agate. The second class of figures—the electric cohesion figures*—differed entirely with the fluid used, the surface on which it was placed (whether glass or mica), the intensity of the electric current, and the pole (whether positive or negative) by which the fluid was electrized. Very splendid and large figures were made on chemically

* In producing the electric cohesion figures, a plate of brass is laid on the table, and covered with a sheet of black paper dripping in a solution of chloride of calcium; on this the glass plate is laid, and in the centre of the glass plate the minute drop of fluid to be electrized. One pole of the induction coil is connected with the brass plate, the other with the drop. The figures instantly shoot out as soon as the induction coil break is set in motion.

clean plate-glass by powerful induction coils. But the greatest variety of figures occurred when the thinnest microscopic glass and mica were employed, with a small induction coil, giving a spark of about a tenth of an inch. The electric figures on mica differed entirely from those on glass; and those on mica freshly split from those on mica washed, heated, or exposed to the air; in fact, the slightest change in the character of the fluid, or the surface on which it was dropped, resulted in the production of difference of figures. The electric figures projected on the screen imitated curious forms and species of *Ulva*, *Ceramium*, *Delesseria*, and finely-branched lycopodiums. Dr. Wright stated that in these cohesive figures of Tomlinson and himself, the pattern-designer possessed a source of infinite diversity of form, free from the stiffness of the designs furnished by the kaleidoscope of Brewster. Many of the figures in mica glowed with all the gorgeous tints of the soap bubble.

At the close of the discourse, his grace the Duke of Argyll moved a special vote of thanks to Dr. Wright for his admirable exposition, which was seconded by Dr. Stevenson Macadam, and unanimously agreed to.

The Society then proceeded to private business.

DUBLIN INTERNATIONAL EXHIBITION, 1865.

It is eminently satisfactory to learn that this enterprise, undertaken by Irishmen, actuated solely by patriotic motives, will fully realise the hopes of its promoters. The preparatory arrangements are in a forward condition, and the promises of support from home contributors ensure the success of the Exhibition.

Continental exhibitors have come forward with alacrity, and from them large contributions are expected. From France there will be a magnificent collection of bronzes and goldsmiths' work, of silks and laces; it is even hinted that the *Gobelins* and *Sèvres* will not be unrepresented. Austria will send specimens of all those beautiful manufactures which attracted so much attention in 1862. Italy intends to surpass herself; filigree work from Genoa, ornamental metal work from Milan, mosaics from Florence, and cameos from Leghorn, will attest the renewed industrial activity of this rising country. A display of sculpture, equalling, if not surpassing, the attractive collection sent in 1862, is promised from Rome. The show of manufactures from Belgium will be in proportion to the extent of her important industries. Countries in the North of Europe will be chiefly represented by works of Fine Art, of these special details will be given hereafter.

One special feature of this Exhibition, not attempted on any former occasion, will be an international display of musical instruments. A large hall, specially designed for concerts, and capable of seating 3,000 persons, has been devoted to this purpose. In it the instruments of all nations will be collected, and daily performances will take place during the continuance of the Exhibition. Exhibitors will therefore have the advantage, not only of showing their works, but also of having them tested under most favourable circumstances, and music as an art will be added to the other attractions of the Exhibition.

The following foreign committees and agencies have already been nominated:—

AMSTERDAM.—*Commissioners*—Mons. C. E. Vaillant and Dr. J. A. Van Eyck.

BERN.—*Commissioner*—Professor Vogt.

BRUSSELS.—*Committee*—M. Fortamps, Senator; M. Corr Vander Maeren; and M. Jules Kindt, Industrial Inspector, &c. *Secretaries*—M. Dulieu; M. C. J. Clerfeyt, *Assistant*. Office, 80, Avenue de la Toison d'Or.

CHRISTIANIA, NORWAY.—*Committee*—J. R. Crowe, Esq., C.B., Her Majesty's Consul, and M. E. Tidemand.

CONSTANTINOPLE.—Edward F. Ede, Esq.

COPENHAGEN.—Professor Hümell.

DUSSELDORF.—*Commissioners for Prussia*—Herr Alexander Von Sybel, Elizabeth Strasse; William Mulvany, Esq.; and M. Adolph Tidemand.

FLORENCE.—*Committee*—Baron Ricasoli; Marchese Ginori; Cav. Cesare Conti, Pres. Chamber of Commerce; Cav. Niccoli Antinori, Sec. Academy of Fine Arts; Charles Lever, Esq., H.B.M. Consul for Spezzia. *Secretary*—Signor P. L. Barzelotti, Advocate. Office, Chamber of Commerce, Florence.

FRANKFORT-ON-MAINE.—*Commissioner*—Herr Peter Bender, Market-place.

MILAN.—*Committee*—Cav. Antonio Caimi, Sec. Academy of Fine Arts; Comm. Giulio Curioni, Sec. Lombard Institute; and Cav. Carlo Pisani, Sec. Chamber of Commerce.

NUREMBERG.—Dr. Beeg, Director of the Industrial Museum.

PARIS.—*Commissioners*—M. Savoye, M. Cappe, and M. S. Ferguson, fils (special for Class C). *Secretary*—M. Tolhausen. Office, at the Palais de l'Industrie, Porte No. 1, Champs Elysées.

ROME.—*Commission*.—Baron Comm. Pier Domencio Constantini Baldini, Minister of Commerce, Fine Arts, and Public Works, *President*; Cav. Luigi Cosi, *Vice-President*; Comm. Luigi Griffi, Sec. Ministry of Commerce, &c., *Secretary*; Comm. Tommaso Minardi, Inspector of Public Pictures; Comm. P. Ercole Visconti, Commissary of Antiquities; Comm. Pietro Tenerani, Director of the Pontifical Museums and Galleries; Comm. Luigi Poletti; Cav. Francesco Podesti; Cav. Giovanni Batista de Rossi; Comm. Virginio Vespignani; Comm. Niccola Cavilieri S. Bertolo; Cav. Prof. Benedetto Viale Prelà; Prof. Francesco Pratti; Cav. Valerio Trocchi, President of the Chamber of Commerce; Prof. Clement Luigi Jacobini; and Cav. Prof. Giuseppe Ponzi.

STOCKHOLM.—*Committee*—T. C. Hunt, Esq., H.B.M. Consul, and Count Rosen.

TURIN.—*Committee*—Comm. Devincenzi, Royal Museum of Industry; Hon. H. G. Elliott, H.B.M. Ambassador; Professor Manna, formerly Minister of Agriculture, &c.; Comm. Matteucci, formerly Minister of Public Instruction; Cav. G. B. Tasca, President of the Chamber of Commerce; Cav. Pio Agodino; Cav. Luigi Rey; and G. P. Jervis, Esq., *Acting Secretary*. *Assistant*—Signor Antonio Fassini. Office, at the Royal Industrial Museum.

VIENNA.—*Commissioner*—Herr Heinrich, Sec. Society of Arts, Tuchlauben, II.

INDUSTRIAL EXHIBITION FOR MARYLEBONE.

A meeting was held on the 13th Dec., at the Marylebone Court-house, Marylebone-street, for the purpose of getting up a Working Classes Industrial Exhibition in that populous and wealthy borough.

Sir ROUNDELL PALMER, Attorney-General, who occupied the chair, observed they must all feel anxious that opportunities should be given to the promoters of industrial pursuits and the fine arts among the working men, to have their works presented before the public in a manner as advantageous as those of others, and perhaps more so, especially as they had now had resources, by means of these exhibitions, which ought to enable them to compete with advantage with any other class in this metropolis. The language held in a resolution passed on the 14th of September, declaring that exhibitions of this kind were eminently calculated to promote inventions and industrial arts, did great good, by rousing the public mind to their advantage. Exhibitions of this kind showed clearly what could be done even under great disadvantages. The credit of the works of the artisans, or working classes, had hitherto too frequently been given to the employers instead of the artisans themselves, and it was therefore exceedingly desirable to give the latter an opportunity of receiving the rewards due to their success. It was clear

that such industrial exhibitions promoted inventive arts, and ought therefore to be encouraged by every possible means. He had been told that some anxiety was felt because the exhibitors at these exhibitions had no the same protection afforded them for their inventions as was given at the great exhibitions. Now to afford that protection was a just principle. Whether there was at that moment any practical objection to such a course he could not take upon himself to say, but he would do the best in his power to remove that evil, and he should be prepared to give due and just protection to them, and in a manner by which they would be enabled to take out their patents as if no publication or exhibitions of this kind ever existed.

The Rev. EARDLEY WILMOT, one of a deputation from the Central Committee, said they lived in an age of progressive improvement in arts and sciences, and especially among the working classes; and he would remind them that one of the greatest improvements of the day—namely, the system of railways—was the invention of a labouring man, Mr. George Stephenson. As regarded the proposed Industrial Exhibition, there was no doubt whatever that, socially, morally, and artistically, it would be of great advantage to the working classes, whose ingenuity and industry were now used, generally speaking, for the advantage of employers. With respect to the movement itself, they had held already many district meetings, formed a general committee, and appointed a treasurer to receive subscriptions, in order to form a guarantee fund. They were in treaty for the Polytechnic Institution, and hoped by the end of next March to have an Exhibition open for a few months, which would be of the greatest possible advantage.

Mr. MORRELL said no less than £244 was already subscribed by the working men themselves as a guarantee fund. As to a protection being given to exhibitors, their learned chairman told them he would do all in his power to obtain it; and they had already a similar promise from the Commissioner of Works. Such a protection was granted at the Great Exhibition, and he was sure Lord Palmerston would afford the same to the working classes.

Mr. HOWE moved, and Mr. MORRIS seconded, the first resolution, "That this meeting cordially approves the proposed Industrial Exhibition for the working classes for the borough of Marylebone, and pledges itself to use every exertion to carry it out."

Mr. GRAHAM would be glad to render every assistance in his power for the success of the Exhibition, and had great pleasure in supporting the resolution.

Mr. HURTON moved, and Mr. PINNER seconded, the next resolution:—"That a district committee, to be called the Court House Committee, be formed out of this meeting, who shall arrange their own place and time of meeting; and depute three of their members as representatives at the Central Committee, which meets every Friday evening at the Working Men's Club."

Mr. NICHOLAY supported the motion. He had taken an interest in other Exhibitions, and especially in that of North London, which was an eminent success in every particular, and realised, after paying all expenses, upwards of £1,000, which was now in the hands of the committee, and would be devoted to some useful public object.

Fine Arts.

ROYAL ACADEMY.—At the recent examination of the Royal Academy silver medals were awarded to Mr. Thomas Davidson, for his painting from the life; to Mr. Frederick George Oakes, for the best copy in oil colours; to Mr. Claude Andrews Calthrop, for the

best drawing from the life; to Mr. Richard Lincoln Alldridge, for the best drawing from the antique; to Mr. James Griffiths, for the best model from the antique; to Mr. Sydney Williams Lee, for the best architectural drawing; to Mr. Horace Henry Cauty, for the best perspective drawing; and to Mr. Richard Phené Spiers, the travelling studentship for one year, for architectural design. —On Friday evening, 16th December, at a general meeting of the Royal Academy, two associates were admitted to full honours to fill the places left vacant by Thomas Dyce and Sir Watson Gordon. The choice fell upon Mr. Thomas Faed and Mr. John Callcott Horsley. The vacancy by the death of David Roberts has not yet been filled up.—Mr. Solomon Hart, R.A., has been elected librarian of the Royal Academy, in the place of Mr. Pickersgill, R.A., resigned.

THE QUEEN'S NEW CAMEOS.—The Queen has commissioned Signor Saulini, of Rome, to execute a number of cameos in shell, representing the busts of her Majesty and the late Prince Albert. Some of these beautiful works, exquisite in conception and in art, have arrived in London, where they will be set in gold, and presented, it is said, as others have been, either to members of the Royal family or to distinguished ladies, personal friends of the Queen. One not uncommonly meets with German ladies who wear on the left shoulder decorations presented by their sovereign, and perhaps her Majesty in this touching way has instituted an order to perpetuate the memory of one in every manner so worthy of her deep affection. The likeness of Prince Albert is inside, that of the Queen outside, and both are admirable specimens of the artistic skill of Saulini. Already by command of her Majesty six cameos have been cut in *pietra dura* (onyx), four in shell, and five more in shell have yet to be completed. Those in the *pietra dura* require long and patient labour, each occupying from three to four months in completion.

RE-ARRANGEMENT IN THE LOUVRE.—Those who have not visited Paris for a year or so will find many alterations. In the first place, there are the new galleries containing the works of the French School, the extensive Campana and Sauvageot collections, and the great Etruscan room, of which mention has already been made in the *Journal*. More recently two large apartments in the basement of the New Louvre have been opened to the public, one containing the statues and busts belonging to the Campana collection, which, however, are very unfortunately placed with respect to the light, the vaulting being low and flat, and both sides pierced with numerous windows. This great defect is not felt in the companion gallery, which is now occupied by the electro-galvanic reproductions of Trajan's column, which were referred to in a cursory manner in the report of a visit to the works of M. Oudry, at Auteuil, which appeared in the *Journal* some months since. The whole of these extraordinary reproductions may now be seen and examined conveniently. These beautiful casts have been set up in their proper spiral order on six sections of a column, each about twenty feet in height, with the exception of the four sides of the square basement which stand against the walls of the gallery; every portion is well exhibited, and the whole forms an admirable study. We understand that a complete and illustrated description is being prepared by command of the Emperor. The portion of the great picture gallery built by Louis XIV. is now completely demolished, and its reconstruction, in harmony with the beautiful work of Henry IV., is about to be commenced. Lastly, the administration is at the present moment considering the question, or rather trying the experiment, after the example of the Tribune of Florence, of introducing sculpture into the picture galleries. In the centre of the apartment known as the Salon Carré, the square room in which are placed the *chefs-d'œuvre* of the collection, has been placed the famous "Diane à la biche;" at the door which leads from this room into the great gallery are a

"Venus" and a "Bacchante;" and at the end of the small gallery, which contains a collection of the works of the Italian School, stands the "Diane de Gabics." There is no doubt that the effect of the statues is good, but the removal of such works causes a terrible blank in the sculpture gallery.

Manufactures.

GAMBOGE.—At a meeting of the Pharmaceutical Society, on December the 3rd, Mr. Daniel Hanbury read a paper "On the Botanical Origin of Gamboge," by which it appears that the exact botanical origin of gamboge has long been involved in obscurity, for though it was known to be a plant of the genus *Garcinia*, the species had never been determined. Hermann, who lived in Ceylon in the 17th century, referred the origin to two plants—one now known as *Garcinia Morella*, the other as *G. Cambogia*—and it is stated by Mr. Thwaites that the former yields a good form of the drug, but not the latter. Gamboge, however, is not an export from Ceylon, but is produced in Siam, a country as yet but little known to botanists. Whether gamboge was obtained from the same tree in Siam as that which yielded it in Ceylon could only be decided by the examination of good botanical specimens. Some years ago, Dr. Christison received from the Messrs. D'Almeida, of Singapore, specimens of *Garcinia* cultivated by them which had been brought from Siam as the true gamboge tree. Dr. Christison found the plant to be nearly allied to *G. elliptica* of Wallich, but differed by having pedicellate instead of sessile male flowers. Recently the author has received specimens from the Messrs. D'Almeida, and has compared them with a variety of descriptions, figures, and specimens, the result of the comparison confirming Dr. Christison's observation that but for the pedicellate flowers the plant bore a strong resemblance to *Garcinia elliptica*, and, further, came equally near *G. Morella* of Desrousseaux. Under these circumstances he sent specimens to Mr. Thwaites, in Ceylon, for his opinion, who replied that he believed the specimen to be a form of *G. Morella*, scarcely differing from the Ceylon type, except in having pedicellate in place of sessile flowers. The author and other botanists, therefore, now describe the gamboge-yielding plant under the following names and synonyms:—*Garcinia Morella*, Desrousseaux; var. *pedicellata*. Syn.; *G. Morella*, Desrousseaux; *G. elliptica*, Wallich; *G. Gutta*, Wight; *Hebradendron Cambogioides*, Graham; var. *β pedicellata floribus masculis pedicellatis*. The number of trees now growing on the plantation of Messrs. D'Almeida is twenty-eight. They are from thirty-five to fifty feet in height, and the largest has a circumference of three feet. They grow very luxuriantly on the side of a hillock without any attention. Gamboge has been at times extracted from them, but only as a matter of curiosity.—Professor Bentley said that Mr. Hanbury has now supplied the last link wanting in the chain of evidence to prove the true botanical origin of gamboge. He believed that there was no specific difference between the gamboge trees of Siam and Ceylon; they were simply varieties, depending probably upon soil and cultivation.

CHURCH BELLS.—The new belfry of the church of St Germain-l'Auxerrois will soon receive a set of chimes similar to those for which Strasburg, Dunkirk, Bruges, &c., are celebrated, but with the improvements suggested by the progress of modern mechanical art. M. Collin, who is entrusted with their execution, has rejected all the cumbersome old contrivances which exclude the possibility of playing several tunes except at an enormous cost. While the cylinder or barrel which works the chimes at Bruges, for instance, cost 60,000*fr.*, M. Collin's barrels will cost only 250*fr.* each, so that as every tune requires a barrel by itself a great variety of tunes will be

obtained at a very trifling cost. Instead of the enormous weights attached to the works under the old system he employs Lenoir's gas-machine as a motive power, whereby he forces air into a reservoir so as to produce a pressure of 2½ atmospheres. The air thus accumulated passes into a series of bellows, replacing the levers of the old system, and thus the artist who sets the chimes in motion finds an instrument as easy to play as a piano. The chimes will consist of forty bells, and will play two different tunes daily—one at two p.m., and the other at eight p.m.

PORTSMOUTH BLOCK MACHINERY.—A writer, under the signature of "J. B.," in a letter addressed to the *Times*, says:—"In your impression of the 17th inst. is a notice of the collection of Naval Models at South Kensington Museum, in which the block machinery at Portsmouth is said to have been 'invented by Sir Isambard Brunel, for the use of the Government, early in the present century,' and it is said that 'this invention was rewarded liberally by the Government.' Sir Isambard Brunel did not invent, nor did he ever claim to have invented, the block machinery which he had a share in setting up at Portsmouth. The original invention, or series of inventions, was by two men, father and son, each named Walter Taylor, natives of Southampton. The beginning was rather more than a century ago, and was made by the father, who had been at sea, and had been practically impressed with the inefficiency of the blocks in use in his time. After a time they took out a patent for part of their inventions, and subsequently a second patent. These included friction wheels and circular saws, both of which we owe to the Taylors. During the continuance of their patents they, under contract, supplied the Government with blocks for the navy, and for some years theirs were the only blocks used in the Royal navy. When, towards the close of the last century, their patents expired, they wished to obtain an extension of them, but the Government objected, and decided on setting up the machinery for themselves. Mr. Walter Taylor, the son, who was then making his blocks at the Wood Mills, South Stoneham, near Southampton, generously offered to the Government every facility for the purpose. The Government employed two clever young men to set up the machinery—one of whom was Mr. (afterwards Sir) Isambard Brunel, and the other Lieutenant (afterwards General) Benthams, R.E. With the benefit of Mr. Taylor's explanations these two young men examined his machinery, and then proceeded to set up machinery on the same principle at Portsmouth. Having the resources of Government to back them they improved the details of the machinery, using for it steam power instead of water power, by which Mr. Taylor's mills were worked; but in every essential point the block machinery at Portsmouth is the invention of the Messrs. Taylor. General Benthams's share in the improvements has been forgotten as much as the Messrs. Taylor's original invention. Some years ago the specifications of the patents were printed in the *Builder* newspaper, and they will enable any one of a mechanical turn of mind who wishes to ascertain how far Messrs. Brunel and Benthams were indebted to the Messrs. Taylor to do so easily. The originality of the invention was more than once publicly claimed for the Messrs. Taylor during the lifetime of Sir I. Brunel—once in your own columns—and the claim was never contested by him or by General Benthams, although, I believe, General Benthams's widow objected that too little credit had been assigned to her husband. Would it be quixotic to hope that Government, which has so greatly benefited by the invention of the Messrs. Taylor, would, at the South Kensington Museum, give some intimation of their obligations to them?"

PETROLEUM AS FUEL.—Mr. B. H. Paul, in a communication to the *Chemical News*, says:—"Some months ago considerable interest was excited by the announcement that very remarkable results had been obtained in America by the application of petroleum as fuel for the boilers of steam vessels, and so much importance was attached to the subject, that a commission was appointed by the

Government of the Northern States to inquire into this application of petroleum. The report published by the commission, as the result of their labours, was calculated rather to excite curiosity than to afford satisfactory information, and they have not, so far as I am aware, made public any further data which would afford a means of arriving at an opinion on the subject. The proposal to use petroleum as steam fuel in ships became, almost of course, a subject of consideration in this country, and an idea prevailed that this invention might possibly supersede in importance all the recent improvements connected with the naval or mercantile marine. It was anticipated that not only naval warfare, but even navigation itself, might be completely revolutionised by this invention. It was reasonable enough that a project put forward with such pretension, as was the case in respect to the use of petroleum as fuel for steam vessels, should be considered in a country where every improvement relating to steam navigation is of high importance; but it is surprising that no one should have disabused the public mind of the erroneous impressions produced by the statements as to the use of petroleum as fuel; for to any one conversant with the composition and characters of petroleum, as compared with coal, this proposed application of it was obviously absurd. Little has been heard of this project until some days ago a notice appeared in the *Times*, under the head of 'Naval and Military Intelligence,' stating that experiments are being conducted at the Woolwich Dockyard, with the view of testing the capability of petroleum to supersede coal and other fuel on ship-board, &c. In this notice it was stated that the oil was so utilised 'as to be equal for steam purposes to five tons of coals.' How much of the oil was equal to five tons of coals was not stated, but it may be fairly supposed that any one unacquainted with the subject would infer that one ton of oil was meant. Now, what are really the facts of the case as to the comparative advantages of petroleum and coal as fuel? In the first place, one of the chief alleged advantages of petroleum over coal, was that it would lie in a small compass and make less demand upon space and tonnage than coal does. Since with petroleum in the place of coal, two-thirds of the space now required for fuel in a steam vessel would be saved, steam ships might keep at sea three times as long as at present. Then, coal depôts would be unnecessary for steam packets on the longest lines of ocean navigation; and since no stokers would be needed in using petroleum, a whole army of employes might be dispensed with. Now, the specific gravity of coal is from 1.24 or 1.44 to 1.6. while that of petroleum is from 0.800 to 0.850, consequently the weight of a cubic foot of these materials would be, respectively, about as follows:—

	lbs.	lbs.	lbs.
Coal	77.4	90	100
Petroleum...		50	53

But, since petroleum, being liquid, lies in a more compact manner than coal, in estimating the spaces occupied by these materials, allowance should be made for the interstices or empty spaces between the lumps of coal. Taking this as amounting to one-third of the whole bulk of a heap of coals—which is a liberal allowance—the contents of a cubic foot would be as follows:—

	lbs.	lbs.	lbs.
Coal	52	60	70
Petroleum	50	53	—

So that the spaces occupied by equal weights of coal and petroleum would be about as 1 is to 1.2 or 1.4. Then the relative heating power of equal weights of coal and petroleum would depend upon their respective chemical composition, which may be compared as follows for 100 parts:—

	Coal.	Petroleum.
Carbon	83	85
Hydrogen	5	15
Ash, &c.	12	—
	100	100

Accordingly, the relative heating power of equal weights of coal and of petroleum would be in the following ratio:—

	Coal.	Petroleum.
Calorific power	1.02	1.50

And the spaces occupied by quantities of petroleum and of coal, having equal heating power, would be in the ratio of 1 to 1.16. This difference in favour of petroleum is in itself too small to admit of any advantage being gained in regard to stowage, and it is more than doubtful whether there be any other advantageous difference between petroleum and coal for fuel. It must also be considered how far the difference between the prices of petroleum and coal would have the effect of neutralising the above, or any other advantage to be gained by the use of petroleum as fuel. The price of petroleum varies from £15 to £20 per ton, while that of coal used for steam-vessels is under £1 per ton at any part of the British coast, and even at the coaling stations in the East it does not exceed £2 10s. to £3 10s. per ton. These considerations alone appear to me to decide the question as to the practicability of using petroleum as steam fuel under any possible circumstances, for even in the case most favourable for the comparison of petroleum with coal, the cost of equal quantities of heat produced from these materials, would be in the ratio of £15 to £4. In addition to this, the highly inflammable nature of petroleum must be considered. Its storage on board a ship would require the use of air-tight vessels, and even then there might be considerable risk of the production of explosive mixture of the petroleum vapour and air. But what would be the condition of a vessel of war provided with petroleum as fuel, if a shot penetrated the vessel containing the petroleum, and allowed it to escape in proximity to the boiler fires? Taking all these circumstances into consideration, I think there cannot be any doubt as to the entire fallacy of supposing that petroleum can be substituted for coal as fuel; and though this conclusion is sufficiently evident from the data I have adopted as to price, &c., it must also be remembered that the tendency is rather to a rise in the price of this commodity than otherwise."

Commerce.

IMPORT OF COTTON.—In the first three quarters of the present year, raw cotton of the enormous value of £56,334,266 has been imported into this country, an amount equal to the sum paid for the cotton import of the entire year 1863, and far exceeding the value of the cotton import of any previous year. The value of the cotton import of the year 1860 was but £35,756,889, and the quantity received for that sum exceeded 12,000,000 cwt. Only half that quantity has been received in the first nine months of 1864 for the far larger sum first mentioned. The quantity received in the first ten months of the year was 3,076,073 cwt. in 1862, 4,226,127 cwt. in 1863, and 6,146,796 cwt. in 1864. In the first ten months of 1862 India sent us 2,190,604 cwt., and Egypt 429,464 cwt.; in 1863, India 2,611,985 cwt., and Egypt 661,104 cwt.; and in 1864, India 3,355,747 cwt., and Egypt 892,419 cwt.

PLUMBAGO ON LAKE SUPERIOR.—Another extraordinary mineral discovery has been made on Lake Superior, being no less than a rich mine of plumbago (graphite). It was found on the tract of the Marquette Silver Mining Company, and it is said that Prof. Cassels, of Cleveland, who has made an assay, pronounces it the best plumbago he ever saw, and if it is plentiful, the mine is worth more than any gold mine in the country. Capt. Sweet, who is familiar with the ground, says the mine is very rich. There are several mines of very inferior graphite found in North America, the product of which is used in the

manufacture of crucibles, and for other uses in manufactures. None of it is fit for pencils. The Silver Lead region of Lake Superior must be a wonderful place if all the "discoveries" located on it amount to anything. Lead, silver, gold and plumbago appear to put the discoverers in doubt as to which they shall mine for first. Iron is close by and copper not far off. All that is needed now to complete the discoveries is tin.

BONNETS.—In the south-eastern part of Massachusetts 12,000 persons are employed in bonnet factories, and they send away annually nearly 8,000,000 bonnets and hats

Colonies.

NEW ZEALAND.—A considerable number of measures have engaged the attention of the Council of this Province (Hawke's Bay), not the least important of which is one to re-appropriate the loan of £60,000 agreed to in a former session. The appropriation now stands as follows;—£30,000 for the purchase of land from the natives; £10,000 for immigration; £1,000 for a lighthouse for Napier Port; £5,000 for a bridge over the Ngarurovo; £7,000 for the completion of the main trunk line, known as the Te Auta-road; and £7,000 for harbour purposes; the last item not to be expended until an opinion has reached us from a competent authority in England. With reference to the item of £30,000, appropriated out of the loan for the purchase of native lands, it was stated in the Provincial Council, by Mr. Ormond, one of the members of the Executive, that Mr. McLean, in his capacity of Native Land Purchase Commissioner, was sanguine of being able shortly to purchase some good lands from the natives. Should this hope be realized, the land will be set aside for agricultural purposes, so as to make the province more attractive as a field for immigration.

ANOTHER RAILWAY IN NEW ZEALAND.—An offer has been submitted to Government to make, as soon as the state of the country would allow, a railroad to Wanganui. It is to be a single line, capable of carrying an engine of not less than fifteen tons, but the offer does not include stations or rolling stock, the line to be given up piece by piece as completed. The payment asked for is land at the rate of an acre and a half for every pound sterling expended by them in making the railroad up to £4,000 per mile, that is to say, that each mile of railroad will cost 6,000 acres of land, but cannot cost more. It is proposed that the contractors should not take the whole of the land adjacent to the railway, but take it in blocks alternately with the Government.

NATAL.—The *Natal Mercury* says:—"The tract of land now known as No-man's-land is about to lose that familiar and expressive name. That district has a frontage of 35 miles to the sea, a depth of 130 miles to the mountains, and an area of 5,000 square miles, or three millions of acres. About one-third of this, that is, the portion near the coast, belongs by right and cession, and it is now proposed to be so by law, to this colony. This little slice of ours is made somewhat rugged by the existence of twenty streams that flow into the sea, and the report likens it to the country between Durban and Pinetown. If this be the case we see no reason why it should not be a most valuable site for the settlement of European agriculturists. The climate of this region resembles that of Natal, being, however, slightly modified by its greater distance from the equator. There is one misfortune, however, connected with it—a population already resides there, various small tribes of Kaffirs, numbering in the aggregate 10,000 people.

AUSTRALIAN COINAGE.—The quantity of gold-dust imported into the Sydney branch of the Royal Mint, from the 1st of January to the 16th of September, 1864, amounted to 552,885 ounces. For the corresponding period of the year 1863, the receipts were 326,014 ounces.

The coin issued during the present year had been 2,006,000 sovereigns against 766,000 sovereigns and 558,500 half-sovereigns during 1863. Total value, £995,250. The quantity of gold received from Melbourne and New Zealand at the Mint accounts for this large increase in the receipts of the year notwithstanding the serious falling off in the yield of our gold-fields.

Obituary.

MR. JOHN FOWLER, of Leeds, died on the 4th Dec. from the result of an accident while hunting. This distinguished pioneer in the application of steam power to the cultivation of the soil, was born at Melksham, in Wiltshire, in 1825, his father being a banker and merchant in that town. John Fowler early devoted his attention to mechanics. He was originally engaged in commercial pursuits, but so strong was his love of mechanics that he left the counting-house and entered the engineer's workshop. He was apprenticed to an engineering firm in the North of England, after which he went to the Orwell Works at Ipswich, where, in conjunction with Mr. Fry, of Bristol, he first made experiments in the application of steam to the drainage of land; and it was whilst he was engaged at Messrs. Ransomes and Sims' works that he made his first experiment in steam ploughing. It was also at these works that most of his engines and tackle were made, up to the time when he won the Royal Agricultural Society's prize of £500, at Chester, in 1858. While carrying out draining operations, John Fowler's attention was first directed to the cultivation of the soil by the aid of steam; and at the Royal Agricultural Society's Show at Carlisle, he arranged with Mr. Smith, of Woolston, to produce a steam engine and windlass for moving Mr. Smith's cultivator. The late Robert Stephenson, M.P., then warmly took up the subject of steam ploughing, and it was after this time that Mr. Fowler went to Leeds, where, in conjunction with the late Mr. Hewison, he erected the extensive works now in operation. Mr. Fowler, previous to erecting the works at Leeds, acquired the right to use almost all the patents for the application of steam power to the tillage of the soil; and since the establishment of the works at Leeds, a great many engines and tackle have been supplied for various parts of the world. The rapid development of the use of steam cultivation since 1859 is partly due to the fact that the war in America directed attention in Egypt and elsewhere to the extended cultivation of the cotton plant; and during the last two or three years the principal orders for steam cultivators have come from Egypt. Upwards of 300 of Mr. Fowler's apparatus are also at work in various parts of the United Kingdom, and his steam ploughs are in operation in America, Egypt, India, the Australian Colonies, and New Zealand, and on the Continent of Europe. For several years Mr. Fowler obtained the chief prizes offered by the Royal Agricultural Society of England at their competitive trials, and from most of the local societies, but it was the prize of £200 which he first received from the Highland and Agricultural Society of Scotland, to which Mr. Fowler attached the greatest importance, as he believed it led the way to the more general appreciation of the steam plough in England. At the last International Exhibition he received a medal for his steam plough and cultivator. Mr. Fowler was elected a member of the Society of Arts in 1855, and on the 30th January, 1856, at an ordinary meeting, read a paper before the members, "On cultivation by Steam; its Past History and Probable Prospects," which will be found reported in the 4th vol. of the *Society's Journal*, page 168.

Notes.

SOCIAL SCIENCE ASSOCIATION.—The Council of the Social Science Association have decided to hold their next meeting in Sheffield, in the autumn of 1865.

IMPROVED LEVEL.—At the meeting of the Institution of Civil Engineers, December 13, Mr. F. B. Doering exhibited and explained a level which, for readier adjustment, was supported upon a gimbal joint, instead of on parallel plates; and he stated that the plan was applicable to other surveying instruments. The method was similar to that adopted for a ship's compass, with the addition of vertical arcs, at right angles to each respective axis, which were clamped to each other and to the frame that was screwed on to the ordinary tripod stand. In the field, when using this instrument, however uneven the ground might be, the legs were put down in the most convenient manner, irrespective of level. The clamps holding the telescope rigid with the stand were then slackened, and the telescope set approximately level by hand. The clamping screws were then tightened, and the final adjustment effected by two tangent screws at right angles to one another, and connected respectively with each arc at the clamps. On moderately level and firm ground, it was not necessary to unclamp the joint of the instrument, as it might be set up approximately level in the ordinary way by the legs, and be brought to a perfect adjustment at once by the tangent screws. By dividing one of the arcs into degrees, the instrument might be used for measuring vertical angles, and thus the height of any point at a distance, required for checking, might be obtained. It was believed that, by this method, a level could be set up on sidelong, soft, or broken ground, with as much ease as on firm, level ground; and that, as none of the moveable parts were liable to become jammed, as in the parallel-plate system, a more perfect adjustment was practicable. A level constructed in this manner had been tried in wet weather and in high winds, and proved to be as steady as any instrument hitherto made.

GAS IN EGYPT.—On the evening of the 23rd September the city of Alexandria was lighted for the first time by gas, the works having been erected by a French company. The lamplighter is nightly followed in his rounds by a crowd of wondering Arabs, who insist that the marvellous blaze following the touch of his torch must be provoked by the will of a *genie*, or "djinn," as Mr. Lane would have us spell the familiar word of the Arabian nights. This improvement causes a great change in the habits of the place. Heretofore a municipal regulation had required everybody going abroad after nightfall to carry his own lantern, but this is no longer necessary.

PARIS INTERNATIONAL EXHIBITION 1867.—It is reported in Paris that the idea of erecting a huge building over the Seine is given up—which will astonish few persons—and that the building for the next Great Exhibition will be a Crystal Palace, erected in a new boulevard, extending from the Arc de Triomphe, at the top of the Champs Elysées, to the river. The building now projected is to be large enough to give every country as much space as it may desire. It is to occupy the central portion of the boulevard, only leaving space for a carriage-way and for pedestrians, and on the other for a railway, or probably an American tramway. It is proposed to erect a steam lifting pump on the bank of the river, to supply the requisite quantity of water for all purposes.

EXHIBITION OF DOGS IN PARIS.—An exhibition of this kind is announced to take place in May next. The administration of the Jardin d'Acclimatation has just obtained the permission of the Prefect of the Seine to hold the next exhibition of dogs in the Cours la Reine, between the Champs Elysées and the river, between the two bridges the Pont de la Concorde and the Pont des Invalides, and consequently in a much more accessible position for the general public than the gardens of the

Society in the Bois de Boulogne, where the first dog show took place last year.

Correspondence.

RADIAL LOCOMOTIVES, SPRING TIRES, AND WOOD WHEELS.—SIR,—In the discussion on my paper of Dec. 7th, Mr. Teulon said that, "all changes on railways must be made with great caution;" and here I agree with him, though possibly we may differ in our modes of verification as to tests. I think it quite possible to do it rapidly, as iron beams are tested to breaking by heavy loads, while possibly Mr. Teulon might be disposed to apply the test of time with an ordinary load, and so carry his experiment over thirty years or more. It is better to make a positive experiment than a negative one. With regard to my radial engine, positive experiments have been made with it during the last eighteen months, and a body of the most eminent railway engineers have experimented with it; and I am authorised to say that in the proceedings of the Institution of Civil Engineers, not yet published, on the occasion of a paper read by Mr. Cross, the engineer of the St. Helen's line of railway, my radial engine was approved of by Mr. Hawkshaw, Mr. Charles Hutton Gregory, Mr. Vignoles, Mr. T. E. Harrison, Mr. G. Berkeley, and others, without a dissentient voice. Mr. Teulon, in addition to being a member of the Council of the Society of Arts, is also a Director of the South-Eastern Railway, and Chairman of the Committees of Rolling Stock and Way and Works. It is, therefore, very important that he should be accurate in all his statements, but it is clear that he is not what the Americans call "posted up" in the early details of mechanism on the South-Eastern, and especially in the history of the wood wheels thereon. The first wood wheels were mine, and applied to some carriages built by me for the opening, when Mr. Baxendale was chairman. These wheels were composed of centres of cast iron discs, surrounded by two circles of fellies doweled together break joint, each row being four inches in depth, on which the tire was shrunk by heating and cooling in the absence of a machine for pressure. The results of these wheels were so satisfactory that I subsequently applied solid discs of radial timber to cast iron centres for the same line, when the tires were applied cold by pressure, being secured in their places by the retaining rings of Mr. Mansel. This arrangement of end timber was not so good as the side grain of the former wheels. The present mode on the South-Eastern is a circle of wood fellies, about an inch in thickness, placed between an iron wheel and the tire, but the tire is heated and cooled to apply it, and this is not desirable, cold pressure being the safest. The principle is, in fact, precisely the same as in my earlier wheels. The true plan, in constructing such wheels, is to bend a piece of straight-grained timber into the form of a hoop, and place it within a tire rolled with a front flange, forcing the wheel into it with the tire cold by hydraulic pressure, and then securing it with a flat ring at the back, sprung into a shallow groove. In this made the retaining rings and bolts may be dispensed with, and the whole structure much simplified, as shown in a specification of mine, older than that of Mr. Mansel, quoted by Mr. Teulon. But even when made in the best mode, there is a serious defect when the two wheels are rigidly fixed on one shaft, by the torsion of the axle on curves and irregularities of the rails, though the wood packing tends to lessen the mischievous vibration. And there is another defect, in the contingency of using wood not properly dried, which may occur when manufactured on a large scale. It is well known that ordinary road wheels, if they stand long in the sun in dry weather, get loose, and require soaking in water to tighten them. A number of wood railway wheels were sent to India, in which discs of wood were applied between tire and centre. When unshipped a Lancashire inspector described them as

"tumbling to pieces and the discs rolling up and down the beach like so many cheeses." There is another objection. If a tire bearing on wood gets loose, the wood will grind away as it revolves, and be spoiled. It was for this reason that I turned my attention to the desirability of getting rid of the wood altogether, and substituting an elastic hoop of tempered steel. The result of this has been thoroughly satisfactory. It is evident that the only value of the wood is as a cushion and not as a flexible spring, and that it cannot slip upon the tire to compensate for varying curves, and prevent torsion of the axle. But the flexible spring does permit of slip of the wheel within the tire to prevent mischievous torsion of the axle, and it does also permit of horizontal variation in the tread to prevent unequal bearing, with a positive flexible yield to absorb blows; while in the case of a loaded driving wheel it permits a certain amount of flattening on the tread and an absence of jumping, which is very favourable to increased adhesion. And as the tension cannot be excessive and cannot be increased in time of frost, there is no risk of bursting the tires, while they can be removed and replaced without taking the engine or carriage into workshops. The remarkable results obtained in increased durability only require to be widely known to ensure their adoption generally, and the more especially in countries where repairs are difficult, and durability, above all, desirable. The reduction of wear in the tire surfaces permits them to be made considerably thinner and consequently of better metal, and prevents that mischievous fly-wheel action resulting from wheels with heavy peripheries. Mr. Teulon's remarks on the possibility of incessant travelling by rail would be better corroborated by individual names, tabulated, and stating distances, how many days together, and for what period of time kept up, sex, age, height, proportions, complexion, temperament, &c., all given by a medical man. These would be statistical facts to set against the general impression of injury to health.—I am, &c., W. BRIDGES ADAMS.

MEETINGS FOR THE ENSUING WEEK.

- TUES.**...Ethnological, 8. 1. Mr. John Evans, F.R.S., "On Flint Implements from Salisbury Hill, near Bath." 2. Mr. Khanikof, "Contributions to the Natural History of the Iranians." 3. Mr. W. Martin Wood, "The Hairy Man of Jesso."
Royal Inst., 3. Prof. Frankland, "On the Chemistry of a Coal." (Juvenile Lectures.)
Actuaries, 7. Mr. Peter Gray, "On a Table for the Formation of Logarithms and Anti-Logarithms."
THURS....Royal Inst., 3. Prof. Frankland, "On the Chemistry of a Coal." (Juvenile Lectures.)
SAT....Royal Inst., 3. Prof. Frankland, "On the Chemistry of a Coal." (Juvenile Lectures.)

Patents.

From Commissioners of Patents Journal, December 16th.

GRANTS OF PROVISIONAL PROTECTION.

- Agricultural produce, machinery for cutting, &c.—2970—R. Maynard
Atmospheric air, purifying, &c.—2937—J. White.
Bells—2956—J. Evans.
Boats, propulsion of—2899—J. Macintosh and A. H. Thurgar.
Boots, shoes, &c., apparatus for eyeletting—2957—M. F. Heinzmann.
Bricks, machinery for making—2972—G. Axton and J. Leach.
Bromine and bromides, obtaining—2948—L. Leisler.
Bubbles from soapsuds, apparatus for blowing—3047—W. E. Newton.
Cannons, &c.—2947—R. W. Sievier.
Carriage axles and boxes—3063—E. Partridge.
Carriages, apparatus for indicating the time engaged, &c.—2978—J. Pinaud.
Cigar of other materials than tobacco—2977—J. D. De Boulimbirt.
Clockwork—3033—W. E. Gedge.
Copolites, apparatus for washing—2936—T. Perkins.
Cotton fibre, apparatus for separating from seed—3009—E. A. Cowper.
Deep sea soundings, apparatus for taking—2980—A. E. Dobbs.
Dye-stuffs, purple—2894—W. V. Wilson and J. A. Wanklyn.
Engines, feeding of scribbling and carding—3007—G. Walles and B. Cooper.
Engraving, apparatus for—2941—P. E. Gaiffe and E. Zglinicki.
Feathers, &c., metallic ornamentation of—2944—W. Clark.
Fibrous materials, machinery for combing—3065—W. Tongue.
Fibrous substances, fuel, &c., presses for—2707—G. Ashcroft.

- Fibrous substances, opening and scribbling—2921—P. Garnett.
Fire-arms, breech-loading—2907—J. Leetch.
Fish, preparing and potting the roes of—2986—J. Banger.
Fuel, combination of materials to be used as—2852—A. Wall.
Furnaces, condensing and collecting products volatilised in—3035—W. T. Watts.
Fuzes—3015—C. W. Lancaster.
Gas, apparatus for heating and cooking by—3013—R. A. Brooman.
Gas, escapes of, apparatus for indicating, &c.—2984—M. Henry.
Gas, regulating the supply of—3039—J. Keeling.
Heavy bodies, trucks or carts for carrying and elevating—3031—H. Lamplugh.
Hooped skirt, manufacture of—2760—A. V. Newton.
Hydraulic presses—2942—E. Cottam.
Hydro-beer pumps—2968—W. Jackson and W. Giahholm.
Letters, balances for weighing—2885—W. Clark.
Liquids, method of cooling—8923—F. Millins.
Marine steam boilers, construction of—2565—W. E. Newton.
Marmalade, preparation of—2938—W. Keiller.
Metals, obtaining dense and flawless castings of—2831—G. Bell and R. Luthy.
Mills for grinding grain—3025—J. Goodier and T. Lee.
Minerals, machinery for cutting—2962—W. E. Carrett, J. Warrington, and J. Sturgeon.
Motive power, apparatus for generating—2803—W. Clark.
Paper, manufacture of—2963—J. R. Crompton.
Pipes for smoking—2952—T. B. Laws.
Pumps—3005—T. W. Gray.
Railways, diminishing wear and risk on—2764—W. B. Adams.
Railways, permanent way of—3055—J. Livesey and J. Edwards.
Railways, signalling and giving alarm on—2767—J. Henshaw.
Railways, switches or points for—2950—T. Knowles.
Reaping and mowing machines—3043—W. J. Burgess.
Rice, apparatus for cleaning—3027—J. Yearsley and E. Timbrell.
Roofs, walls, &c., construction of—2647—R. W. Wilton.
Sewage, decolorising and utilising—2832—G. E. Boone.
Shafts, reducing the friction of—3003—M. J. Roberts.
Ships, compound for coating the bottoms of—3049—A. D. Hall.
Soap, machinery for cutting into bars—3061—A. V. Newton.
Spinning machinery, giving pressure to the drawing rollers of—2992—J. McIntosh.
Steam boilers, apparatus for feeding—2940—L. Valant.
Steam boilers, feeding—2988—E. M. Shaw.
Steam boilers, generating steam in—2976—A. Wheatley.
Steam engines—3011—J. France.
Steam engines and rotary pumps—2960—T. Greenhalgh.
Table covers—2946—W. Ward.
Textile fabrics, preparing to be oiled for packing—2964—J. Smith.
Umbrellas, parasols, and sun-shades—3037—J. Stephenson.
Ventilating cupola chandelier—2934—F. Sang.
Wadding, &c., manufacture of—2709—E. Pilkington.
Warming and ventilating apparatus—2932—J. Kissack.
Wool, separating or recovering the fibres of—2958—J. Rowley.

PATENTS SEALED.

- | | |
|---------------------------------|--------------------------------|
| 1523. R. Jones. | 1591. W. D. Napier. |
| 1525. R. Smith & C. Sieberg. | 1602. C. Denis. |
| 1527. A. Smith. | 1620. W. Clark. |
| 1531. T. Wordsell. | 1747. G. W. Pitcher. |
| 1532. T. Mayor. | 1855. T. Dixon. |
| 1541. H. Phillips. | 2018. E. Andries. |
| 1549. I. Buckley & E. Crossley. | 3061. F. G. Underhay & R. Hey- |
| 1550. John Bottomley. | worth. |
| 1551. E. A. Inglesfield. | 2097. H. Potter. |
| 1580. J. Hinks and J. Hinks. | 2230. H. Potter. |
| 1581. A. Knowles & J. Barra- | 2326. H. Potter. |
| clough. | 2420. E. Loyel. |
| 1588. W. A. Guy, E. Edwards, & | 2442. G. T. Bousfield. |
| R. W. MacArthur. | 2443. J. Johnson and T. John- |
| 1589. R. W. MacArthur, A. Guy, | son. |
| & E. Edwards. | |

From Commissioners of Patents Journal, December 20th.

PATENTS SEALED.

- | | |
|------------------------------------|--------------------------------------|
| 1542. W. Carrington and T. Turner. | 1607. H. C. Steane and F. A. Steane. |
| 1543. T. O. Dixon. | 1622. J. H. Wilson. |
| 1545. J. Forbes. | 1656. W. E. Gedge. |
| 1546. A. Smith. | 1663. G. H. Palmer. |
| 1547. T. J. Denne. | 1668. W. E. Newton. |
| 1556. C. Hepstonstall. | 1743. W. L. Wise. |
| 1561. J. Jones. | 1813. W. E. Newton. |
| 1567. G. Carter. | 1847. J. H. Johnson. |
| 1572. J. Smith. | 1860. J. H. Beattie. |
| 1576. R. Cochran. | 1863. G. Furness and J. Slater. |
| 1579. J. Bailly. | 1973. P. A. J. Dujardin. |
| 1595. J. Hay. | 1998. A. B. Childs. |
| 1599. B. F. Stevens. | 2286. E. Slaughter. |
- PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.**
- | | |
|----------------------|---|
| 3111. R. Searle. | 3177. J. M. H. A. Taurines. |
| 3140. R. A. Brooman. | 3291. T. Green, W. Green, and R. Mathers. |
| 3141. R. A. Brooman. | 3225. F. Laurent & J. Casthelaz. |
| 3179. C. Pontifex. | 3239. T. Silver. |
| 3183. E. Stott. | 147. E. C. Nicholson. |
| 3222. T. E. Vickers. | 191. J. Alison. |
| 3258. J. B. Payne. | 3166. R. Scott. |
| 3270. W. E. Newton. | 3181. T. Bourne. |
| 3197. J. Redfern. | |